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ICONES PLEUROTHALLIDINARUM
IV

SYSTEMATICS
OF
ACOSTAEA
CONDYLAGO
AND
PORROGLOSSUM

(ORCHIDACEAE)

Missouri Botanical Garden

ICONES PLEUROTHALLIDINARUM
IV

SYSTEMATICS OF ACOSTAEA CONDYLAGO AND PORROGLOSSUM

Carlyle A. Luer

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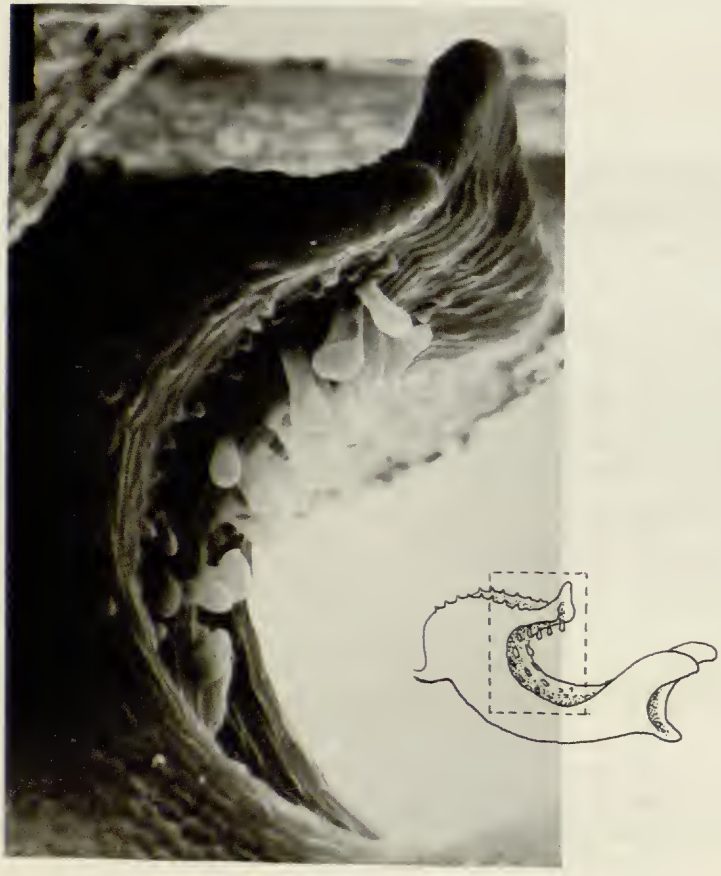
The three pleurothallid genera included in this volume are not closely related, but each has developed independently an actively motile labellum. In each, a stimulus causes the lip to rise quickly. The pollinator is trapped temporarily between the lip, column, and petals. An escape requires the pollinator to brush past the stigma, rostellum, and anther.



Scanning electron micrograph of the apex of the labellar callus of *Acostaea costaricensis* subsp. *unicornis* X140 by Günter Gerlach, Institut für Systematische Botanik und Pflanzengeographie der Universität Heidelberg.

SYSTEMATICS OF THE GENUS ACOSTAEA (ORCHIDACEAE)

ABSTRACT

A history of *Acostaea* Schltr. is given and the genus is described. A key to the species is given. Each species is described and illustrated with a black and white drawing, and a distribution map is included for each.

New taxa:
Acostaea costaricensis subsp. **bicornis** (Luer) Luer
Acostaea costaricensis subsp. **colombiana** (Garay) Luer
Acostaea costaricensis subsp. **unicornis** (Luer) Luer

Dr. Rudolph Schlechter described this genus in 1923, basing it on two collections of very similar plants sent to him by Sr. Guillermo Acosta from near San Ramón in Costa Rica. Schlechter distinguished the new genus by the insertion of the petals onto an elongated column-foot, the remarkable structure of the lip, and the wide-winged column. Since he described the genus from dried specimens, he could not know that the lip was actively motile in living plants.

Schlechter also stated that the flowers were non-resupinate, which is not the case. Resupination in such tiny, dried flowers could be difficult to determine. The flowers are resupinate from a bending backward of the pedicel, not by a twisting of the pedicel and ovary. Also assuming the flowers to be non-resupinate, Garay (1974) presumed that the lip was passively motile, "swinging the pollinator downward" onto the winged column.

The most distinguishing feature of this genus is the sensitive, actively motile labellum. The independently evolved mechanism is totally different from that devised by the other two pleurothallid genera known with sensitive lips (*Porroglossum* Schltr. and *Condylago* Luer), or the few other orchid genera (*Caleana* R. Br., *Drakaea* Lindl., *Plocoglottis* Blume, and *Pterostylis* R. Br.) of other tribes and subtribes (Dressler 1981; M. Clements, pers. comm.).

In 1867, long before Acosta, specimens and excellent pencil illustrations of flowering plants of this genus had been sent to Reichenbach by Endres, also from Costa Rica. Presumably Reichenbach was either uncertain about the peculiarities of the flower, or did not find the time to name and publish the genus before his death in 1889. Perhaps he was unsure of the unusual morphology of the floral parts and was hoping eventually to obtain living plants.

All the species of *Acostaea* are found growing epiphytically on mossy limbs or twigs in cool, moist, neotropical forests usually in association with other pleurothallids. Numerous plants are often present in a population, and they

flower throughout the year. They probably mature and flower within one year from seed. Flowering specimens have been found growing upon the leaf of a large species of *Pleurothallis*. Without flowers the little tufted plants are indistinguishable from many little species of *Pleurothallis* or *Stelis*.

THE MECHANISM OF THE SENSITIVE LABELLUM

The following hypothetical account of the sensitive lip is based on simple observation of the activity of the hinged lip of living flowers. No known detailed experiments have ever been conducted.

It is known that the terminal part, or "apex," of the oblong column-foot is truncate and concave. The base of the lip is attached by a broad, membranous margin to the entire width of the end of the column-foot, creating thereby a thin, transverse hinge. In the "open," or receptive position (Figure 1.) the lip is extended down from the column, and more or less rests upon the synsepal. The prominent callus of the lip is exposed.

Following a stimulus to the callus, the lip suddenly snaps upward to a "closed" position (Figure 2.) between the petals and the large column-wings. This creates an effective cage from which the pollinator can escape only by crawling past the stigma, rostellum, and pollinia. Pollinia adhering to the pollinator would be transported to the stigma of another flower, should the pollinator fall into the trap of the other flower. After a period of time, the lip descends again to the open position.

It is not known how the mechanism works. I suggest that the stimulus received from the callus causes a sudden loss of turgor of certain, critical cells near the hinge, possibly within the concave apex of the column-foot. (A sudden loss of turgor in certain cells supposedly occurs in the totally different mechanism of *Porroglossum* to cause the lip to snap shut. See Systematics of *Porroglossum*, page 26.) Should certain cells within the column-foot near the broad hinge lose turgidity to decrease the width of the column-foot by failing to oppose unaffected outer cells, the lip would rise, much the same as pinching folded paper in Japanese origami causes a mouth to open, or wings to flap. Similarly, if pressure is applied to bend one side of the hinge of a fast-food, hamburger container, the lid closes. Releasing the pressure on the hinge, or restoring the width, causes the lid to open. The loss and restoration of turgidity in cells within the concave column-foot near the hinge could explain the phenomenon.

A second possibility is that the critical cells are located near the base of the callus which occupies the base of the lip. Loss of turgidity here would have a similar effect by decreasing the width of the labellar side of the hinge.

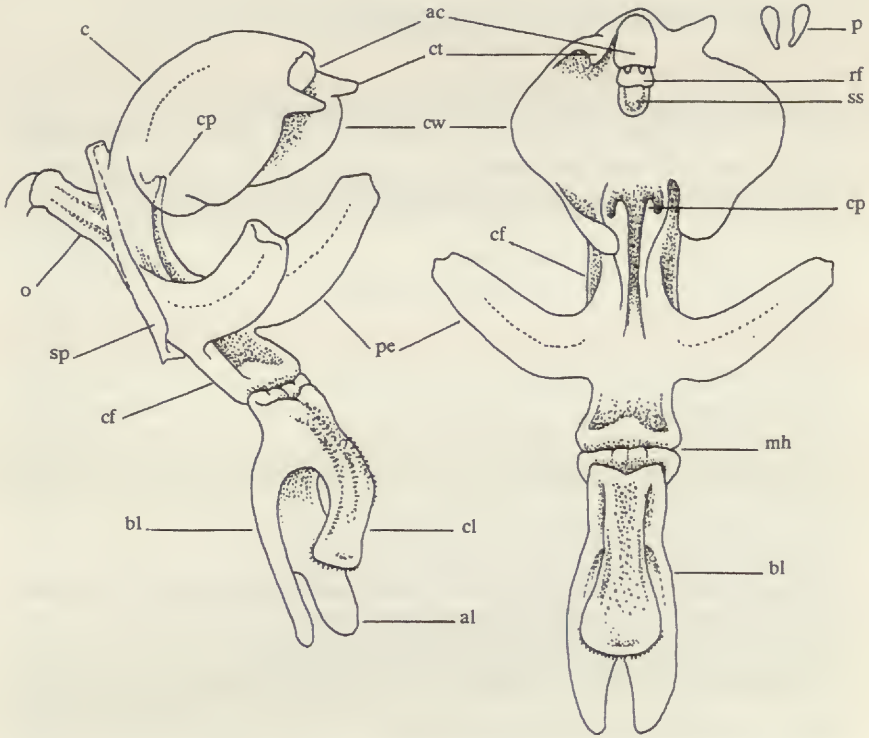


Figure 1. The lip in the open, or receptive position (*Acostaea costaricensis*).

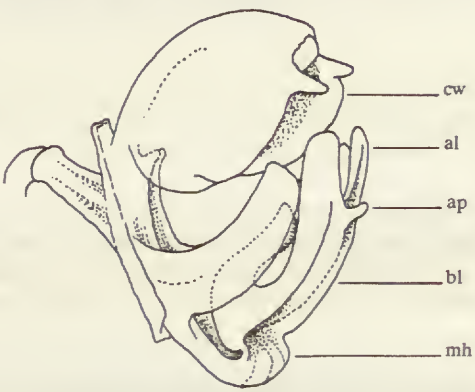


Figure 2. The lip in the closed position.

ac = anther cap; p = pollinium; rf = rostellar flap (from stigma); ss = stigma, receptive surface; c = column; cw = column-wing; ct = apical tooth of the column; pe = petal; cf = column-foot; cp = process of the column-foot; o = ovary; mh = membranous hinge; bl = blade of the lip; ap = apiculum; al = apical lobe of the lip; cl = callus of lip; sp = sepal cut away

KEY TO THE SPECIES AND SUBSPECIES OF *ACOSTAEA*

1 Apex of the callus of the lip rounded 2
1' Apex of the callus of the lip with 1 or 2 minute processes 6

2 Apex of the blade of the lip entire ..... *A. tenax*
2' Apex of the blade of the lip lobed, not entire 3

3 Apex of the blade of the lip trilobed ..... *A. trilobata*
3' Apex of the blade of the lip bilobed with a small apiculum in the sinus 4

4 Callus of the lip cylindrical, less than 1 mm long, from a narrow base ..... *A. campylotyle*
4' Callus of the lip more or less flattened, more than 1 mm long, from a broad base 5

5 Lobes of the lateral sepals with a small angle on the inner margin above the sinus; petals with an obtuse angle on the lower margin ..... *A. costaricensis* subsp. *colombiana*
5' Lobes of the lateral sepals without a small angle on the margin above the sinus; petals oblong, without an obtuse angle on the lower margin ..... *A. costaricensis* subsp. *costaricensis*

6 Apex of the callus of the lip with a central apiculum ..... *A. costaricensis* subsp. *unicornis*
6' Apex of the callus of the lip with a pair of marginal apicula ..... *A. costaricensis* subsp. *bicornis*

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Acostaea trilobata Luer Plate 7.

Acostaea Schltr.

Acostaea Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 283, 1923.

Lectotype: *Acostaea costaricensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 1923. (Index Nom. Gen. 64/24402, 1967)

Ety.: Dedicated Sr. Don Guillermo Acosta, who collected the material upon which the g was described.

Plants perennial, small to very small in size, delicate, epiphytic, densely caespi the rhizome extremely short between ramicauls; roots slender. Ramicauls ascending to e slender, non-pseudobulbous, shorter than the leaf, unifoliate, partially or compl enclosed by 2-3 thin, imbricating sheaths at the base, the inflorescence emerging late with an annulus from near the base; leaf erect, coriaceous smooth, green or dark g elliptical or narrowly elliptical to narrowly obovate, the apex acute to subacute or ob shallowly notched with a mucro in the sinus, the base cuneate, narrowly cuneate, or grad ly narrowed below, usually with a petiole. Inflorescence a loose, successively sev flowered raceme, borne by a slender, smooth, peduncle, usually longer than the leaf, wi bract below the middle; floral bracts thin, tubular; pedicels slender, about as long as floral bract; ovary smooth, lightly costate, trivalvate; sepals conspicuous, membran yellow to red or purple, glabrous, the dorsal sepal carinate, galeate, transversely o obtuse, deeply concave, sometimes minutely ciliate, connate shallowly to the lateral se to form a sepaline cup, the lateral sepals connate above the middle into a bicari synsepal; petals membranous, about as long as the column, more or less oblong-triang acute to obtuse, the base broad, from the lateral margins of the column-foot; lip irregu ly oblong, the apex entire, trilobed, or bifid with an apiculum, the disc with an elongat thickened, more or less pubescent callus arising from just above the base and arc forward, the base of the lip broad, truncate and membranous below the callus, hinged t equally broad apex of the column-foot; column erect within the cucullate dorsal se broadly membranously winged, with a pair of processes at the apex to either side of anther, or erose, the anther apical or subapical, the rostellum retrorse, the pollini separate, yellow, pyriform, with short, thick caudicles and viscidia, the stigma su ventral, the base of the column extended into an oblong column-foot, free beyond the ov with the petals originating from the sides near the middle, with a pair of longitud medial carinae, the carinae sometimes with toothlike processes, the apex of the foot t cate, concave, hinged under cupped tension with the lip.

Three distinct species of *Acostaea* are known in the distribution of genus from Central America through Colombia into southern Ecuador. On them, *A. costaricensis*, is relatively frequent, variable and widespr throughout much of this range, while the other two occur where *A. costarice* does not: *A. tenax* in the Eastern Cordillera of Colombia, and *A. trilobata* the Oriente of Ecuador. A fourth species, *A. campylotyle*, very closely al to *A. costaricensis*, occurs in the central and the western cordilleras Colombia. Three other described species are little more than geograph variations. They will be recognized at the subspecific level. The remaining are not specifically distinct and are treated here within the variable *costaricensis*.

Acostaea campylotyle P. Ortiz, Orquideología 13: 240, 1979.

Ety.: From the Greek *campylotylos*, "a bent callus," referring to the arcuate callus of the lip.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 1-1.5 mm long, enclosed by 1-2 thin, tubular sheaths. Leaf erect, coriaceous, 6-15 mm long including the petiole 1-4 mm long, the blade elliptical or narrowly elliptical to narrowly obovate, 3-4 mm wide, the apex subacute to obtuse, the base cuneate, or narrowly cuneate into the petiole. Inflorescence an erect to suberect, loose, successively few-flowered raceme of 3-8 flowers, up to 30 mm long, borne by a slender, peduncle 10-12 mm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 0.75 mm long; sepals red, rose, or purple, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, 2.5-3 mm long, 3-3.5 mm wide expanded, connate to the lateral sepals for 0.5 mm to form a sepaline cup, the lateral sepals connate to near the apex into a bicarinate, ovate synsepal, 4-4.5 mm long, 3 mm wide, the apex entire to shortly bifid, obtuse; petals rose, membranous, obliquely ovate-triangular, the apex narrowly obtuse, with an obtuse angle on the labellar margin, 1.5 mm long, 0.75 mm wide; lip red or purple, more or less oblong, 1.75-2 mm long, 0.75-1 mm wide, the apex bifid into oblong, subacute lobes ca. 0.3 mm long, with a short, deflexed apiculum in the sinus, the disc with a thick, oblong, arcuate, antrorse callus 0.75 mm long, minutely pubescent, with the apex rounded, arising from just above the base, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column white, erect within the cucullate dorsal sepal, broadly membranously winged, 2 mm long, 2 mm wide expanded, the wings obtusely angled and revolute above the base, bidentate or erose at the apex, the column-foot oblong, truncate, 2 mm long, with a longitudinal pair of low carinae.

COLOMBIA: Dept. of Valle del Cauca: Alto Calima, alt. 1500-1600 m, 26 June 1969, *P. Ortiz & S. Restrepo 247* (Holotype: COL); Dept. of Antioquia: Briceño, collected by P. Ortiz V., flowered in cultivation by M. & O. Robledo, 14 Oct. 1977, *C. Luer 2028* (SEL); Dept. of Nariño: epiphytic in forest around La Planada above Ricaurte, alt. 1800 m, 25 Jan. 1987, *C. Luer et al. 12502* (MO).

This little species occurs in three known localities in Colombia within the range of *A. costaricensis*. *Acostaea campylotyle* is distinguished by the small (less than 1 mm long), arcuate, terete callus of the lip that arises from a narrow base. The callus of the lip of *A. costaricensis* is larger (at least 1 mm long), more or less flattened, and it arises from a broad base. Otherwise, there are no specific differences.

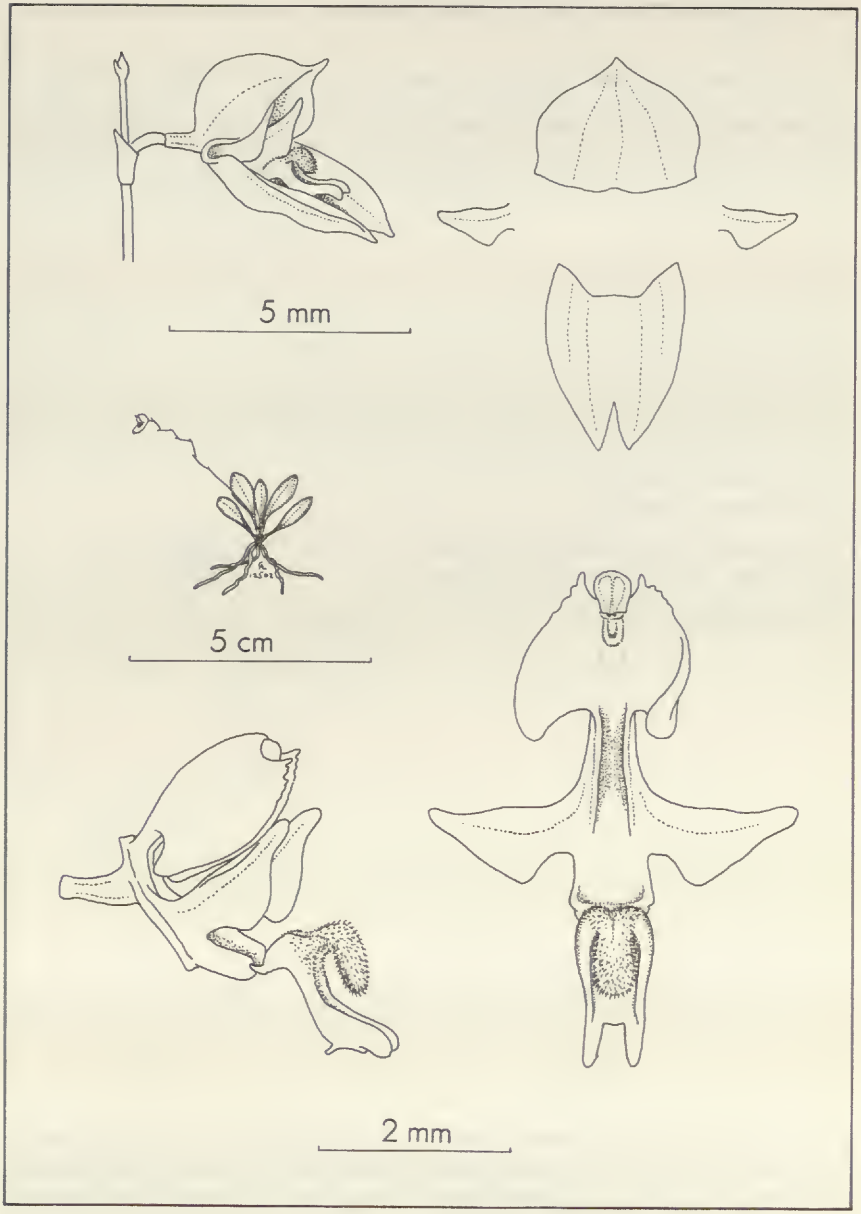

Plate 1. *Acostaea campylotyle* P. Ortiz

Acostaea costaricensis Schltr. subsp. **bicornis** (Luer) Luer, subsp. nov.

Bas.: *Acostaea bicornis* Luer, Phytologia 54: 379, 1983.

Ety.: From the Latin *bicornis*, "two-horned," referring to the apex of the callus of the lip.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 1-3 mm long, enclosed by 1-2 thin, tubular sheaths. Leaf erect, coriaceous, 6-10 mm long including the petiole 2-3 mm long, the blade elliptical to obovate, 2.5-3 mm wide, the apex subacute to obtuse, the base cuneate into the petiole. Inflorescence an erect to suberect, loose, successively few-flowered raceme of 3-8 flowers, up to 30 mm long, borne by a slender, peduncle 10-12 mm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 0.75-1 mm long; sepals translucent yellow, yellow suffused with rose, to red or purple, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, 3 mm long, 5 mm wide expanded, connate to the lateral sepals for 0.5 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate, subacute synsepal, 5 mm long, 3 mm wide; petals translucent yellow, oblong-ovate to lightly falcate, the apex narrowly obtuse, 2 mm long, 0.75 mm wide; lip yellow, more or less oblong, 2 mm long, 0.5 mm wide, the apex bifid into oblong, subacute lobes ca. 0.5 mm long, with a short, deflexed apiculum in the sinus, the disc with a thick, oblong, more or less arcuate, forwardly directed callus 1 mm long, minutely pubescent, arising from just above the base, with the apex truncate with an apiculum at both corners, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column yellow-white, erect within the cucullate dorsal sepal, broadly membranously winged, 2 mm long, 2 mm wide expanded, with a pair of narrow processes at the apex, the column-foot oblong, truncate, 1.5 mm long,

PANAMA: Prov. of Panama: epiphytic in cloud forest, Cerro Jefe, alt. ca. 1000 m, 2 March 1976, *C. Luer, J. Luer, R. Dressler & P. Taylor 744* (Holotype SEL).

Without a strong handlens plants of this subspecies are indistinguishable from those of the general populations of *Acostaea costaricensis*. The apex of the callus of the lip, a structure about 1 mm long, is truncate with each of the two angles developed into a tiny process, like two eyes of a snail. This type of callus is restricted to plants found in one area of eastern Panama, where plants with the usual rounded apex of the callus are also to be found.

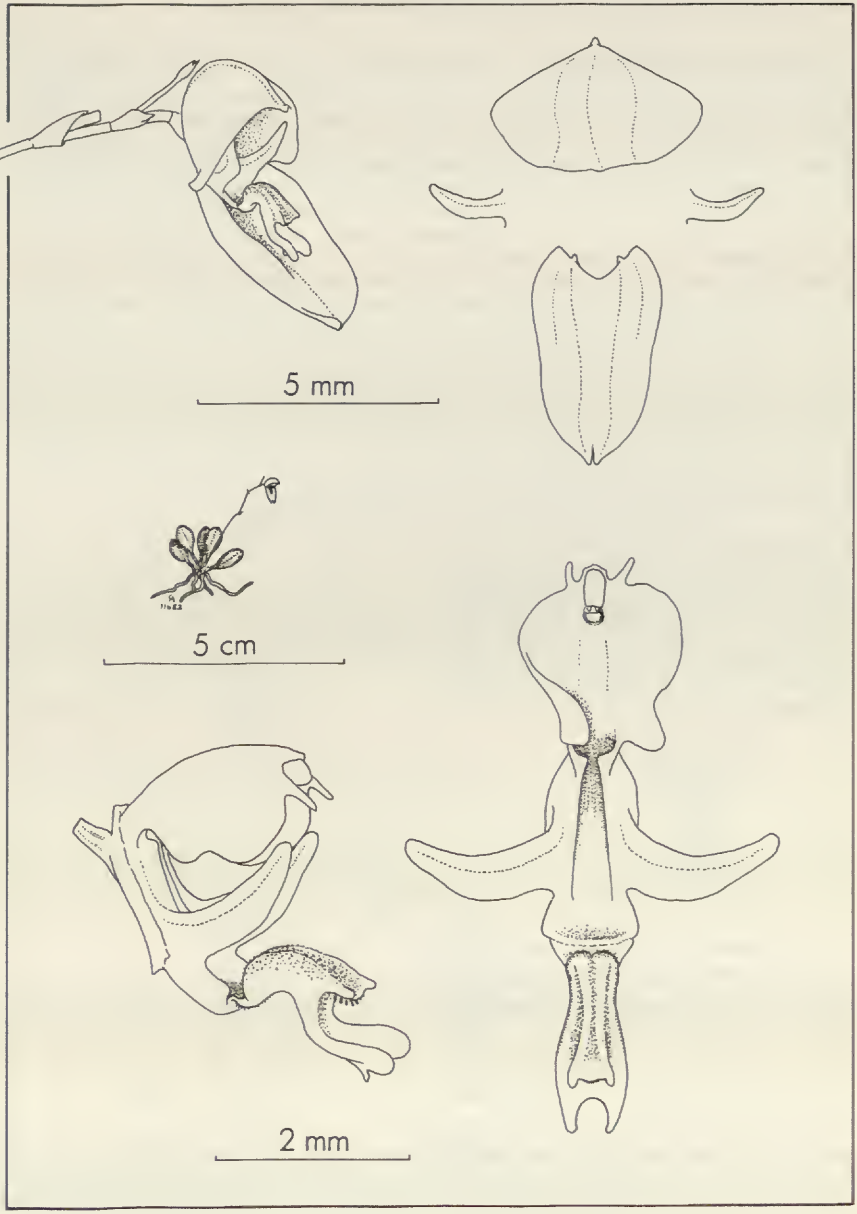

Plate 2. *Acostaea costaricensis* Schltr. subsp. *bicornis* (Luer) Luer

Acostaea costaricensis Schltr., subsp. **colombiana** (Garay) Luer, subsp. nov.

Syn.: *Acostaea colombiana* Garay, Orquideología 9: 112, 1974.
Ety.: Named for Colombia, the country of origin of the plant described.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 2-6 mm long, enclosed by 2-3 thin, tubular sheaths. Leaf erect, coriaceous, 10-33 mm long including the petiole 2-7 mm long, the blade narrowly elliptical to narrowly obovate, 3-7 mm wide, the apex subacute to obtuse, the base narrowly cuneate into the petiole. Inflorescence an erect to suberect, loose, successively few-flowered raceme of 3-8 flowers, up to 30 mm long, borne by a slender, peduncle 10-12 mm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 1 mm long; sepals translucent yellow, more or less suffused with rose, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, 4-5 mm long, 5-6 mm wide expanded, connate to the lateral sepals for 1 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate synsepal, 6 mm long, 3-4 mm wide, the apex bifid, acute; petals yellow, membranous, obliquely ovate, the apex obtuse to narrowly rounded, broadly dilated or obtusely angled on the labellar margin, 1.75-2 mm long, 0.6-1 mm wide; lip yellow to purple, more or less oblong, 2.5 mm long, 1 mm wide, the apex bifid into oblong, lobes ca. 0.5 mm long, with rounded apices and with obtuse angles on the inner margins, with a short, deflexed apiculum in the sinus, the disc with a thick, oblong, more or less arcuate, forwardly directed callus 2 mm long, microscopically ciliate or pubescent, arising from a broad base, with the apex rounded, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column erect within the cucullate dorsal sepal, broadly membranously winged, 2.5 mm long, 2.5 mm wide expanded, with a pair of toothlike processes at the apex, the column-foot oblong, truncate, concave, 2.5 mm long.

COLOMBIA: Dept. of Antioquia: Munic. of Concepción, Cabeceras del Río Concho, *O. J. Arango s.n.* (Holotype of *A. colombiana*: AMES); flowered in cultivation by M. & O. Robledo at La Ceja, 9 Oct. 1977, *C. Luer 1959*; above Santo Domingo, Aguas Frias, alt. 2000 m, 10 May 1985, *C. Luer, R. Escobar & E. Valencia 11326* (MO).

Acostaea colombiana was distinguished by the absence of a tooth at the apex of the column-wings beside the anther, obliquely ovate-falcate, obtuse petals, and the apical lobes of the lip toothed in the sinus. I have drawn a flower from the cultivated plant from which the above description was made. I find that there is indeed a tooth at the apex of the column-wings beside the anther. The shape of the petals varies from that of *A. costaricensis* only in the obtuse angle on the labellar margin. The obscure, obtuse angles on the inner margins of the apical lobes of the lip are also seen in other populations of *A. costaricensis*. Therefore, the angled petals are the only morphological feature that separates *A. colombiana* from *A. costaricensis*. Petals with a similarly angled margin are seen in *A. campylotyle*.

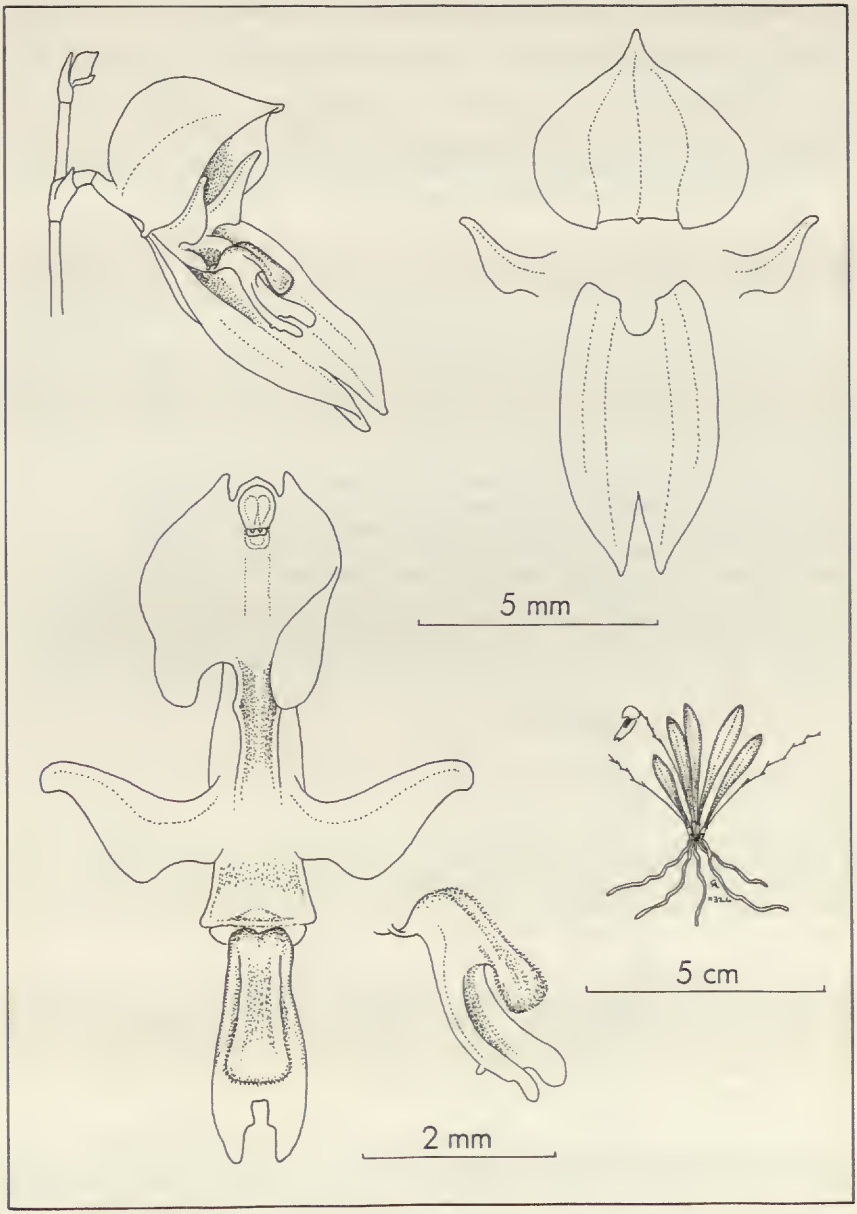

Plate 3. *Acostaea costaricensis* Schltr. subsp. *colombiana* (Garay) Luer

Acostaea costaricensis Schltr., Repert. Spec. Nov. Regni Veg. Beih. 23: 284, 1923. subsp. **costaricensis**.

Ety.: Named for Costa Rica, the country of origin of the plant described.

Syn.: *Acostaea pleurothalloides* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 23: 285, 1923.
Ety.: Named for the affinity of the species to the genus *Pleurothallis*.

Syn.: *Acostaea glandulata* P. Ortiz, Orquideología 15: 166, 1982.
Ety.: From the Latin *glandulatus*, "with glands," referring to the pair of tuberosities on the column-foot at the base of the column-wings.

Plants small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 1-5 mm long, enclosed by 2-3 thin, tubular sheaths. Leaf erect, coriaceous, 6-25 mm long including the petiole 2-10 mm long, the blade elliptical or narrowly elliptical to narrowly obovate, 2.5-4.5 mm wide, the apex subacute to obtuse, the base cuneate, or narrowly cuneate into the petiole. Inflorescence an erect to suberect, loose, successively few-flowered raceme of 3-8 flowers, up to 30 mm long, borne by a slender, peduncle 10-12 mm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 0.75-1 mm long; sepals translucent yellow, yellow suffused with rose, to red or purple, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, 2.5-5 mm long, 3.5-6 mm wide expanded, connate to the lateral sepals for 0.5-1 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate synsepal, 4-6 mm long, 2.5-4 mm wide, the apex entire to shortly bifid, obtuse; petals yellow, membranous, oblong, the apex obtuse to narrowly rounded, 1.5-2 mm long, 0.5-1 mm wide; lip yellow to red, more or less oblong, 2-2.5 mm long, 0.5-1 mm wide, the apex bifid into oblong, subacute, obtuse to rounded lobes ca. 0.5 mm long, sometimes with obtusely angled, inner margins, with a short, deflexed apiculum in the sinus, the disc with a thick, oblong, more or less arcuate, forwardly directed callus 1-2 mm long, microscopically to coarsely ciliate or pubescent, arising from just above the base, with the apex rounded, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column erect within the cucullate dorsal sepal, broadly membranously winged, 2-2.5 mm long, 2.5 mm wide expanded, with a pair of toothlike processes at the apex, the column-foot oblong, truncate, concave, 2-2.5 mm long, the longitudinal, medial carinae sometimes with a pair of short, erect, processes just below the wings of the column.

COSTA RICA: Prov. of Alajuela: vicinity of San Ramón, 1921, *G. Acosta s.n.* (Holotype: B?); same area, 1921, *G. Acosta s.n.* (Type of *A. pleurothalloides*: B?); same area alt. "4000 ft.," 1867, *A. Endres 23* (W); Prov. of San José: Cerro Tablazo, alt. 1700 m, 15 March 1986, *C. Luer et al. 12109* (MO); Prov. of Puntarenas: cloud forest before Monteverde forest preserve, alt. 1500 m, 18 March 1986, *C. Luer et al. 12101* (MO).
PANAMA: Prov. of Chiriquí: Cerro Colorado, alt. 1500 m, 15 Feb. 1979, *C. Luer, J. Luer, R. Dressler & K. Dressler 1444* (SEL); same area, alt. 1500 m, 15 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10541* (MO); Fortuna dam site, alt. 1100 m, 16 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10568* (MO); Prov. of Coclé: above Copé, alt. 900 m, 19 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10634* (MO); Prov. of Panamá: Altos de Pacora, alt. ca. 500 m, 28 Apr. 1978, *C. Luer, J. Luer, & R. Dressler 2916* (SEL).
COLOMBIA: Dept. of Antioquia: Guatapé, Quebrada del Rosario, alt. 1860 m, May 1976, *P. Ortiz V. 892* (Type of *A. glandulata*: COL).
ECUADOR: Prov. of El Oro: south of Piñas, alt. 950 m, 20 March 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10671* (MO).

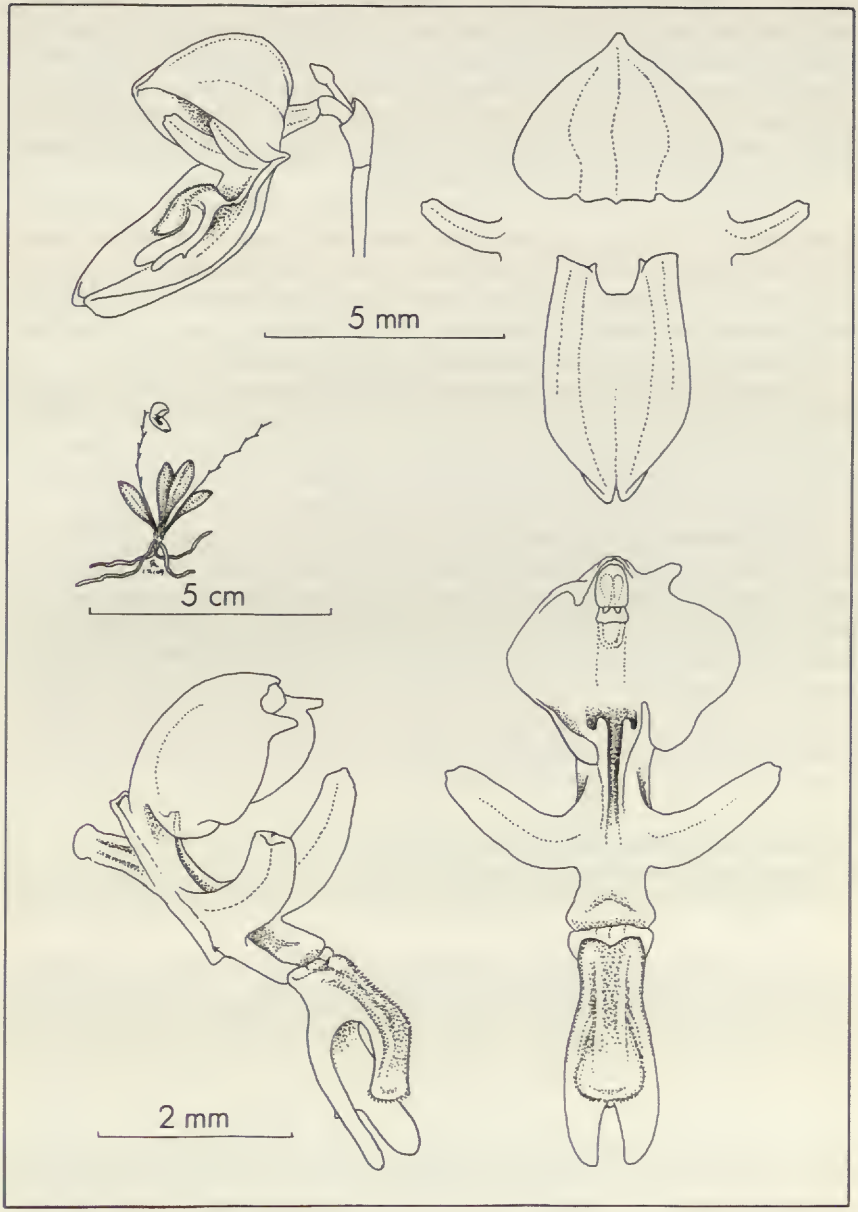

Plate 4. *Acostaea costaricensis* Schltr. subsp. *costaricensis*

This species, the lectotype of the genus, was described by Schlechter from a collection by Sr. Guillermo Acosta from the region around San Ramón, well-known for its abundance of orchids. Two specimens, a "small" one and a "large" one, from the same locality had been sent to Schlechter, possibly chosen by Acosta to demonstrate the extremes in size in the population. Schlechter described them as two species, distinguishing the second or larger specimen by the longer stems, the larger leaves with longer peduncles, somewhat larger flowers, the pointed middle sepal, the ligulate, ciliate, proportionately short callus of the lip, and the rounded column-wings.

All the above features are found in different proportions in different combinations in the various populations found widely and frequently in Costa Rica and Panama, and less frequently in Colombia and Ecuador. Beyond any doubt, the two concepts represent forms of the same species. In addition, local geographical variations with minor solitary differences occur in Colombia and Panama. Some of these populations have been described as species.

Acostaea glandulata was distinguished by the presence of a pair of small projections from the column-foot at the base of the wings of the column. This peculiar pair of teeth, sometimes vestigial, is frequently observed randomly in the flowers of *A. costaricensis* in Costa Rica, Panama, and Colombia, including *A. campylotyle* and forms described as *A. colombiana* .

The Panamanian *Acostaea bicornis* and *A. unicornis* were distinguished by the presence of a pair of lateral apicula at the apex of the callus of the lip, and a single, central apiculum at the apex of the callus, respectively. It was thought that these modified calli were adaptations to specific pollinators, and if this were true, the species should be maintained. Otherwise, these plants are inseparable from *A. costaricensis*. Therefore, the problem will be solved by treating these two taxa as subspecies of *A. costaricensis*. Another Panamanian population is characterized by clusters of prominent glandular hairs at the base of the top of the labellar callus.

Acostaea costaricensis Schltr. subsp. **unicornis** (Luer) Luer, subsp. nov.

Bas.: *Acostaea unicornis* Luer, Phytologia 54: 379, 1983.

Ety.: From the Latin *unicornis*, "one-horned," referring to the apex of the callus of the lip.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 1-4 mm long, enclosed by 1-2 thin, tubular sheaths. Leaf erect, coriaceous, 7-15 mm long including the petiole 2-4 mm long, the blade elliptical to obovate, 3-5 mm wide, the apex subacute to obtuse, the base cuneate into the petiole. Inflorescence an erect to suberect, loose, successively few-flowered raceme of 3-8 flowers, up to 40 mm long, borne by a slender, peduncle 10-12 mm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 0.75-1 mm long; sepals translucent red or purple, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, 3 mm long, 5 mm wide expanded, connate to the lateral sepals for 0.5 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate synsepal, 5 mm long, 3 mm wide, the apex obtuse; petals translucent yellow, elliptical-ovate, lightly oblique, the apex narrowly rounded, 1.5 mm long, 0.5 mm wide; lip yellow to red, more or less oblong, 2 mm long, 0.5 mm wide, the apex bifid into oblong, subacute lobes ca. 0.5 mm long, sometimes with obtusely angled, inner margins, with a short, deflexed apiculum in the sinus, the disc with a thick, oblong, more or less arcuate, forwardly directed callus 1 mm long, minutely pubescent, arising from just above the base, with the apex rounded, with a central apiculum, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column erect within the cucullate dorsal sepal, broadly, membranously winged, 2 mm long, 2.5 mm wide expanded, with a pair of oblong processes at the apex, the column-foot oblong, truncate, 1.5 mm long, with longitudinal, medial carinae.

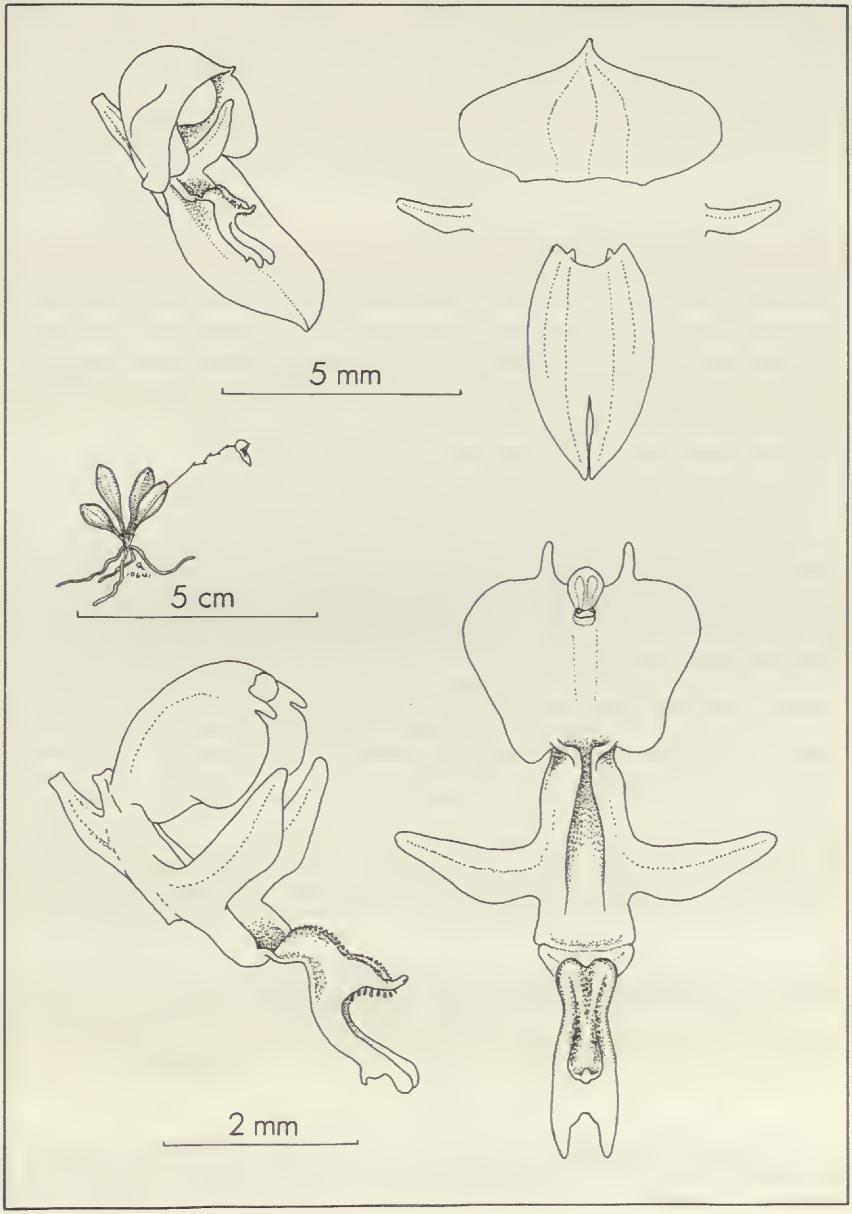

Plate 5. *Acostaea costaricensis* Schltr. subsp. *unicornis* (Luer) Luer

PANAMA; Prov. of Coclé; epiphytic in cloud forest above El Valle, alt. 900 m, 6 March 1976, *C. Luer, J. Luer, R. Dressler & P. Taylor 760* (Holotype SEL); same area, 20 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10641* (MO); Prov. of Veraguas: epiphytic in cloud forest above Santa Fé, alt. 700 m, 5 Sept. 1976, *C. Luer & R. L. Dressler 1143* (SEL).

This subspecies occurs in central Panama where populations of the typical species also occur. Without a strong lens, no difference can be seen. The apex of the lip of the typical species is rounded and minutely pubescent. The apex of the lip of subspecies *unicornis* is also round, but from the center of the margin a small apiculum arises, and from the under surface of the free apex of the callus some glandular hairs dangle.

Acostaea tenax Luer & Escobar, Orquideología 15: 123, 1982.

Ety.: From the Latin *tenax*, "tenacious," referring to the restraining arms of the column-foot.

Plants small but large for the genus, epiphytic, densely caespitose; roots coarse. Ramicauls ascending to erect, slender, 3-7 mm long, enclosed by 2-3 thin, tubular sheaths. Leaf erect, coriaceous, 10-38 mm long including the petiole 3-10 mm long, the blade elliptical or narrowly elliptical to narrowly obovate, 4-7 mm wide, the apex subacute to obtuse, the base cuneate, or narrowly cuneate into the petiole. Inflorescence an erect to suberect, loose, successively many-flowered raceme (up to 16 flowers) up to 5.5 cm long, borne by a slender, peduncle 2-3 cm long; floral bracts thin, 1.5 mm long; pedicels 1.5 mm long; ovary costate, 1 mm long; sepals translucent yellow, suffused with rose, the dorsal sepal carinate, transversely ovate, obtuse, deeply concave, microscopically glandular cellular on the margins, 5-5.5 mm long, 6 mm wide expanded, connate to the lateral sepals for 1 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate synsepal, 6 mm long, 4.74 mm wide, the apex bifid, subacute; petals yellow, membranous, more or less obliquely ovate, the apex subacutely rounded, broadly dilated on the labellar margin, 2.5-3 mm long, 1 mm wide; lip yellow, ovate, 4 mm long, 2.5 mm wide, the apex obtuse, recurved, the disc with a dark purple, terete, arcuate callus 1 mm long, arising from just above the base, with the end rounded, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column erect within the cucullate dorsal sepal, broadly, membranously winged, 2.5 mm long, 2.5 mm wide expanded, with a pair of narrow, blunt processes at the apex beside the anther, the column-foot oblong, truncate, 2.5 mm long, the longitudinal, medial carinae with a pair of erect, curved, terete, blunt processes 0.5 mm long, just distal to the insertion of the petals.

COLOMBIA: Dept. of Santander: Munic. of Santa Barbara, epiphytic in cloud forest between Santa Barbara and Guaca, alt. 2840 m, 6 Nov. 1981, *C. Luer & R. Escobar 6603* (Holotype: SEL; Isotype: JAUM); epiphytic in cloud forest between Bucaramanga and Berlín, alt. 2550 m, 7 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10200* (MO).

This species occurs in the eastern cordillera of Colombia at altitudes considerably higher that that of any other known population of the genus. Vegetatively and florally, *A. tenax* is

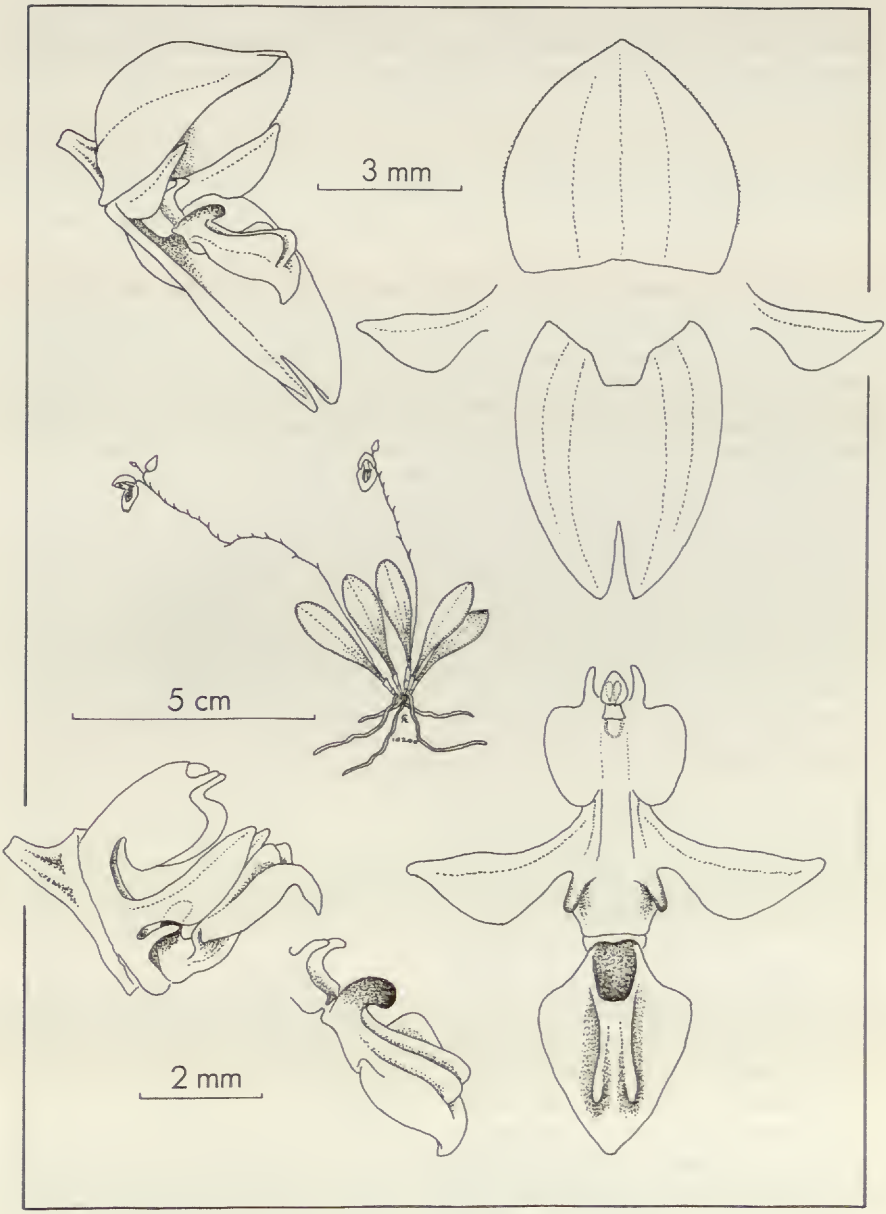

Plate 6. *Acostaea tenax* Luer & Escobar

the largest of the genus. It is readily identified by the entire apex of the lip. The basal callus of the lip is a forwardly bent, cylindrical appendage. When the lip is in the "closed" position, the appendage is grasped by a pair of curved processes from the margins of the column-foot. This peculiar adaptation seems to be an attempt to restrain the lip from descending too quickly to the "open" position.

Acostaea trilobata Luer, Selbyana 1: 216, 1975.

Ety.: From the Latin *trilobatus*, "three-lobed," referring to the prominently three-lobed apex of the lip.

Plants small, epiphytic, densely caespitose; roots slender. Ramicauls ascending to erect, slender, 2-5 mm long, enclosed by 2-3 thin, tubular sheaths. Leaf erect, coriaceous, 8-20 mm long including the petiole 2-5 mm long, the blade elliptical or narrowly elliptical to narrowly obovate, 3.5-4.5 mm wide, the apex subacute to obtuse, the base cuneate, or narrowly cuneate into the petiole. Inflorescence an erect to suberect, loose, successively 3- to 9-flowered raceme up to 3,5 cm long, borne by a slender, peduncle 1-2.5 cm long; floral bracts thin, 1-1.5 mm long; pedicels 1-1.5 mm long; ovary costate, 0.75-1 mm long; sepals red-purple or purple, the dorsal sepal carinate, transversely ovate-triangular, obtuse, apiculate, deeply concave, microscopically ciliate, 4-4.5 mm long, 4-5 mm wide expanded, connate to the lateral sepals for 1 mm to form a sepaline cup, the lateral sepals connate above the middle into a bicarinate, ovate synsepal, 4-5 mm long, 3-3.5 mm wide, the apex bifid, acute; petals purple, membranous, more or less obliquely ovate, the apex subacutely rounded, broadly dilated on the labellar margin, 2-2.5 mm long, 1 mm wide; lip purple, irregularly oblong, 2.5 mm long, 1 mm wide, the apex trilobed, the marginal lobes thick and rounded, the middle lobe similar but deflexed, the disc with an elongated, thickened, lightly sulcate, shortly pubescent callus 1.75 mm long, arising from just above the base and extending forward with the end rounded, the base of the lip broad, truncate and membranous below the callus, hinged to an equally broad apex of the column-foot; column erect within the cucullate dorsal sepal, broadly, membranously winged, 2 mm long, 2 mm wide expanded, with a pair of short, blunt processes at the apex beside the anther, the column-foot oblong, truncate, 2 mm long, the pair of longitudinal, medial carinae with a minute, pointed process just distal to the insertion of the petals.

ECUADOR: Prov. of Napo: epiphytic in tall forest east of Puyo, alt. ca. 500 m, 28 July 1975, *C. Luer, G. Luer & S. Wilhelm 465* (Holotype: SEL); epiphytic in forest, east slopes of Volcán Reventador, alt. 1850 m, 8 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11714* (MO); Prov. of Morona-Santiago: epiphytic in cloud forest between Macas and Guamote, alt. 1750 m, 6 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12703* (MO).

This species occurs locally on the eastern declivity of the Andes of central Ecuador. Although superficially very similar to the other species of the genus, *A. trilobata* is easily identified by the three thick, rounded lobes at the apex of the lip. The pair of tiny teeth on the column-foot just below the insertions of the petals seems homologous to the much larger processes on the column-foot of the Colombian *A. tenax*. These processes are not in the same position as are those often seen at the base of the column-wings of *A. costaricensis*.

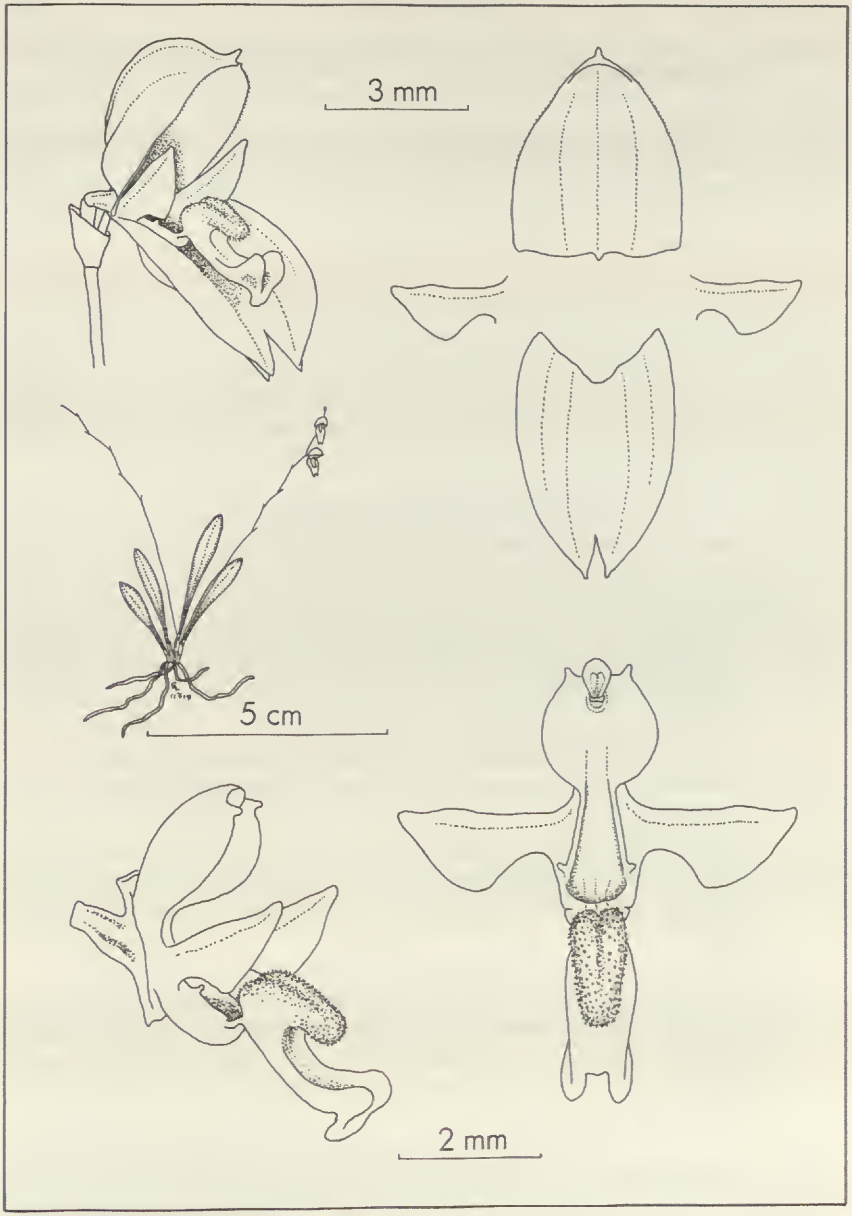

Plate 7. *Acostaea trilobata* Luer

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SYSTEMATICS OF THE GENUS CONDYLAGO (ORCHIDACEAE)

ABSTRACT

The monotypic genus *Condylago* Luer is reviewed, described and illustrated.

This genus, based on a single species, was described in 1982. Plants were first discovered by a collector in 1975, and successfully cultivated by Sr. Rodrigo Escobar R. in Medellín, Colombia. The totally different mechanism of a sensitive labellum sets the genus apart from the other two pleurothallid genera (*Acostaea* Schltr. and *Porroglossum* Schltr.) with motile lips. These three genera are not closely related.

This monotypic genus is endemic to a small region of wet, virgin forest of the northern part of the Western Cordillera of Colombia. It has no known close relatives. The mechanism of the actively mobile lip is unique in the Orchidaceae. Since the mechanism has never been studied, the details of the following discussion have been drawn from simple observation.

As in the species of the other two pleurothallid genera with mobile lips, the lip of *Condylago* is "down" in the receptive position. The flower, as well as the flowers of most of the species of these genera, are borne in the resupinate position with the lip lowermost. At the base of the upper surface of the blade of the lip of *Condylago* a flat, disclike, slightly sticky callus is present. Extending 90° downward from the base of the blade are a pair of rigid, knobbed, armlike appendages that rest at a 90° angle against the rounded, bulbous apex of the column-foot. Between the appendages a thin, slender strap connects the base of the blade to the back surface of the swollen apex of the column-foot.

A stimulus, presumably received somewhere on the blade of the lip, causes the lip to snap suddenly upwards to a position beneath the column. The sensitive site of the "trigger" has not been discovered. The circular disc as well as other areas of the blade have been explored with a pointed instrument, but without finding the sensitive spot. Any movement of the lip, however, sends it quickly into the "up" position, and it stubbornly refuses to be returned to the "down" position.

Presumably a loss of turgor in the swollen tips of the armlike processes at some signal from the "trigger" (as occurs in the inner layer of cells of the clawlike strap of the lip of *Porroglossum*) releases tension between the processes and the swollen apex of the column-foot. This would permit the now unopposed strap to pull the lip inwards and upwards, guided by the processes as they slide downward on the apex of the column-foot. In the "up" position the processes lie parallel to the column-foot. When the turgor has been restored, pressure between the processes and the column-foot, and opposing the pull of the strap, would force the lip back down into the receptive position. The ends of the armlike processes glide over the end of the column-foot much like the femoral condyles ride over the tibial plateau in the knee joint.

Since no sensitive "trigger" spot has been demonstrated, it is possible that the pollinator simply moves the lip as it invades the flower to investigate or to nibble the circular callus, possibly only the "bait." Motion alone will effect the closure.

Condylago Luer, Orquideología 15: 118, 1982.

Type: *Condylago rodrigoi* Luer, Orquideología 15:118, 1982.

Ety.: From the Latin *condylus*, "a condyle," in allusion to the articulation of the lip to the column-foot.

The description of the only species will suffice for the description of the genus.

Condylago rodrigoi Luer, Orquideología 15: 118, 1982.

Ety.: Named in honor of Sr. Rodrigo Escobar of Medellín, Colombia, who has successfully cultivated this species since its discovery.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 2-3 cm long, enclosed by 2-3 loose, tubular sheaths with microscopically papillose margins. Leaf erect, thinly coriaceous, narrowly elliptical, acute, subpetiolate, 5-10 cm long including the petiole ca. 2 cm long, 1.5-2.5 cm wide. Inflorescence a loose, flexuous, successively many-flowered, arching raceme, up to 25 cm long including the peduncle ca. 10 cm long, with a few distant bracts, from near the apex of the ramicaul; floral bract tubular, 4-5 mm long; pedicel from 25 mm long low in the raceme, to 3 mm long above in the raceme; ovary green with purple spots, 3 mm long; sepals green with coalescing spots of dark purple, concave and glabrous toward the bases, convex with revolute sides covered with a long, villous, white hairs above, the dorsal sepal ovate, 9 mm long, 3.5 mm wide, the apex obtuse to rounded, revolute, abruptly apiculate, the sides of the base decurrent on the column-foot, the the lateral sepals oblong, 10 mm long, 2 mm wide, connate to near the middle, forming a mentum with the column-foot, the apices rounded, minutely apiculate; petals dark purple, obliquely obovate-trapeziform, obtusely angled, 4 mm long, 4 mm wide, decurrent on the column-foot with a small, basal lobule; lip dark purple, the blade ovate, 4 mm long, 2 mm wide, the apex obtuse with a pair of parallel calli, the base with a flat, circular, viscid callus, and extended below into a pair of deflexed, rigid, clavate appendages 1.5 mm long, hinged between to the under surface of the column-foot by a slender, flexible strap; column greenish white, semiterete, 4 mm long, the apex denticulate, the margins longitudinally alate, with an equally long foot angled forward, terminated by a bulbous tip in contact with the appendages of the lip.

COLOMBIA: Dept. of Antioquia: Munic. of Dabeiba, Alto de Choromandó, alt. 1400-1600 m, collected by L. Agudelo in 1975, flowered in cultivation by Rodrigo Escobar R. in Medellín, 7 Oct. 1977, *C. Luer 1952* (Holotype: SEL; Isotype: JAUM).

Superficially, the single species known to date in the genus resembles the relatively common and widespread *Pleurothallis flexuosa* (Poepp. & Endl.) Lindl. Vegetatively the leaves of both species are narrowly elliptical and borne by short ramicauls. The racemes of both species are flexuous and successively flowered, eventually much exceeding the leaves in length. The flowers are of similar size and coloration, and the sepals of both are filled within by long, white hairs. The lips, however, indicate no close relationship whatsoever. *Pleurothallis flexuosa* belongs to section *Effusae* of subgenus *Specklinia*.

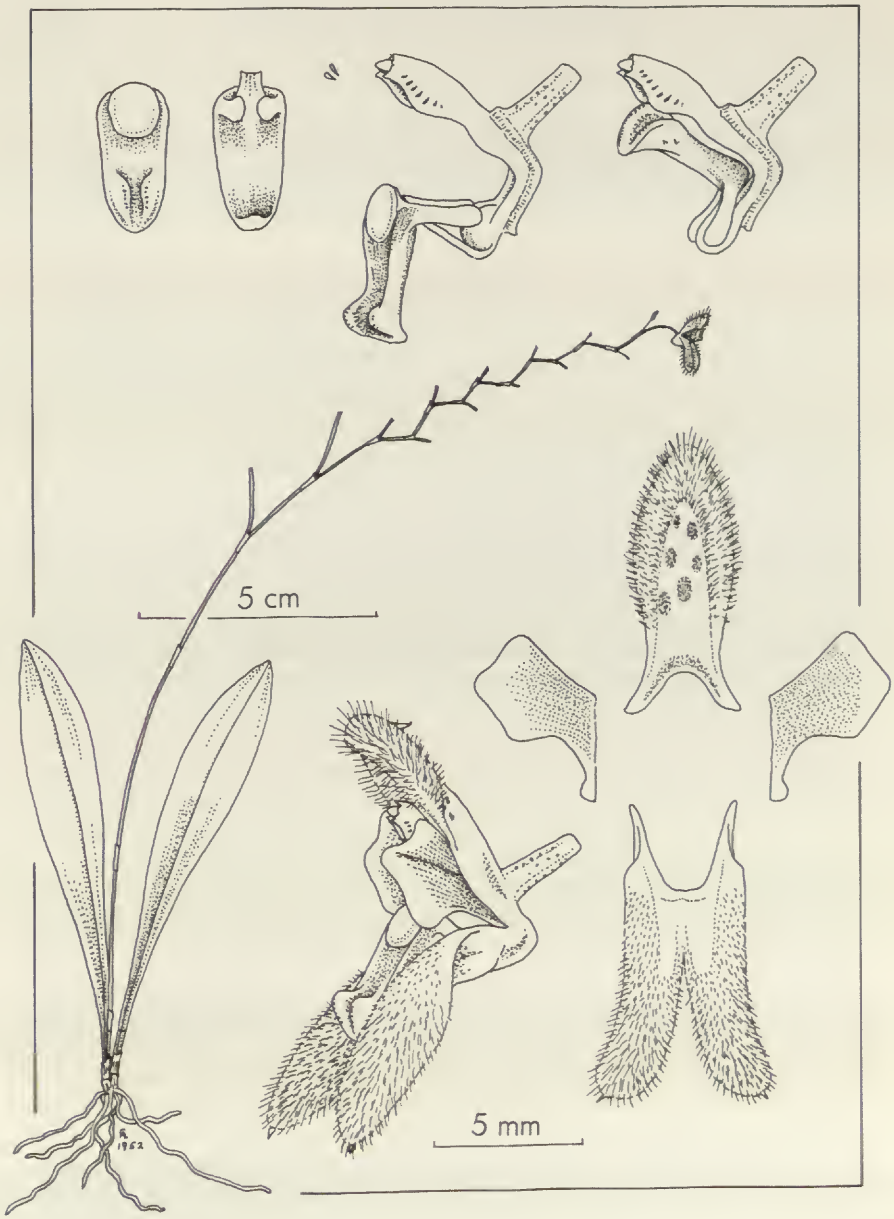

Plate 1. *Condylago rodrigoi* Luer

SYSTEMATICS OF THE GENUS **PORROGLOSSUM** (ORCHIDACEAE)

ABSTRACT

A history of *Porroglossum* Schltr. is given and the genus is described. A key to the subgenera, sections and species is given. Each species is described and illustrated with a black and white drawing. The specimens cited in the distributions are only a selected few of the more frequent species from various localities. A distribution map is included for each species.

New taxa:
Porroglossum subgen. **Eduardia** Luer, subgen. nov.
Porroglossum sect. **Echidnae** (Rchb. f.) Luer, comb. nov.
Porroglossum sect. **Tortae** Luer. sect. nov.
Porroglossum dalstroemii Luer, sp. nov.
Porroglossum hirtzii Luer, sp. nov.
Porroglossum nutibara Luer & Escobar, sp. nov.

The first species of this genus to be described was *Masdevallia echidna* by Professor Reichenbach in 1855 from a collection by Hermann Wagener from the old province of Ocaña in the eastern cordillera of Colombia. Although differing from *Masdevallia* Ruíz & Pav. in many respects, this species seemed to belong in *Masdevallia* because of the habit with a short ramicaul and sepals with long tails. No other genus existed at that time to satisfy these criteria. The properties of the sensitive, or irritable labellum, impossible to be appreciated in dried specimens, would not be recognized for another third of a century.

Between 1875 and 1886, Reichenbach described the next four species of *Porroglossum* as *Masdevallia muscosa, M. xipheres* (a form of *M. muscosa*), *M. amethystina, M. eduardii*, and *M. mordax* to bring the number of species of *Porroglossum* masquerading in *Masdevallia* to five. It would be over 80 years until the next species of *Porroglossum* would be recognized.

In 1887, the sensitive labellum was first observed in cultivated plants of *M. muscosa* by W. Bean, foreman of the orchid collection at the Royal Botanic Gardens at Kew. The phenomenon was investigated and reported in amazing detail by Oliver in 1888. He incised the lip at different levels to determine that a stimulus is passed from the crest of the callus to the springlike mechanism for snapping the lip toward the column. These findings were republished by Leavitt in 1906.

A sensitive labellum with a different mechanism for motility (not merely a passively mobile labellum) has developed independently in two other genera of the Pleurothallidinae (*Acostaea* Schltr. and *Condylago* Luer), and in a few other orchid genera (*Caleana* R. Br., *Drakaea* Lindl., *Plocoglottis* Blume, and *Pterostylis* R. Br.) of other tribes and subtribes (Dressler 1981, M. Clements, pers. comm.).

In 1920, Schlechter recognized sufficient differences in *Porroglossum colombianum* (a redescription of *M. mordax*) and *M. muscosa* to propose the genus *Porroglossum* to accommodate them. Apparently because of a lack of living material, he failed to comprehend the truly fundamental distinction of the species of his new genus. He did not seem to be aware of the observations by

Bean and Oliver. Schlechter pointed out the apical anther and the elongated, curved column-foot with a free apex, but obviously he could not realize the dramatic action involving the free apex and the springlike claw of the lip bent around it under tension. He did not include in his *Porroglossum* the other four species already known. Instead, he transferred *M. echidna, M. xipheres* and *M. amethystina* to *Scaphosepalum* Pfitz., leaving *M. eduardii* and *M. mordax* (the older epithet for his *P. colombianum*) in *Masdevallia*.

In his monograph of the genus *Masdevallia* in 1925, Kränzlin completely failed to comprehend the genus. He reduced *Porroglossum* to the synonymy of section *Echidna*, scattered four species of *Porroglossum* into three other of his sections (*M. eduardii* into sect. *Coccineae*, *M. echidna* and *M. xipheres* into sect. *Echidna*, and *M. amethystina* into sect. *Rhombopetalae*), and to his genus *Lothiania*, proposed the preceding year for *M. mordax*, he added *L. bilabiata* (a synonym of the common, totally unrelated *M. platyglossa* Rchb. f.). He reduced *M. muscosa* to *M. echidna*, and *P. colombianum* to *M. xipheres*. He also described a specimen of *P. mordax* as *Scaphosepalum antioquiense*.

There are two paintings by Lehmann at Kew with the intended names *Masdevallia adenosepala* and *M. sensitiva*. The former can be referred to *P. mordax*, the latter possibly to *P. olivaceum*.

In the past few years, 20 additional species have been discovered to bring the total number of known species to 25. They inhabit the cool, moist, mossy cloud forests of the Andes from Venezuela through Colombia, Ecuador and Peru to Bolivia. Only one species (*P. muscosum*) is known from Venezuela, and only one species (*P. procul*) is known from Bolivia. Eight species are known from Colombia, four species are known from Peru, and 15 have been found in Ecuador. Most of the species are in cultivation, but a few are so rare that they have been seen but once. Undoubtedly other still unknown species will be discovered as new roads penetrate previously inaccessible forests.

THE MECHANISM OF THE SENSITIVE LABELLUM

In the "open," or pollinator-receptive position of the lip (Figure 1.), the outer layer of cells of the upper surface of the straplike claw (the narrow, basal extension of the lip) is pressed against the free apex of the elongated column-foot (the "fulcrum"). The claw is bent under tension away from the back of the free apex of the column-foot from its insertion higher on the back surface of the column-foot. The column-foot is free to near the middle, just below the connation of the lateral sepals to the upper portion of the column-foot. The distal segment of the free column-foot beyond the insertion of the claw is called the "emergence" by Oliver.

A tactile stimulus (from the pollinator under natural conditions, or from an object like a bristle or a pencil point under greenhouse conditions) received by the callus causes a sudden loss of turgor in the outer layer of cells of the claw in contact with the apex of the column-foot leaving the tension of the outer layer of cells of the under surface of the claw unopposed (Oliver 1888). This releasing of the pressure of the claw against the apex of the column-foot, causes the lip to snap suddenly inwards to the "closed" position (Figure 2.), thereby thrusting the pollinator against the stigma and under surface of the column.

There is often a momentary hesitation after the initiation of the movement before the lip rapidly closes in about one second. The springlike claw now fits snugly against the back surface and around the apex of the column-foot. The size and position of the callus of the lip that now presses against the front surface of the column-foot seem to limit the degree to which the lip can be closed. Apparently this is necessary, depending upon the size of the required pollinator.

The stiff petals act as bars to prevent the escape of the pollinator from either side. Probably the pollinator normally escapes from the trap before the lip again expands. The only avenue of escape is forward where contact with the rostellum and anther can be made. Pollinia are thereby carried away with the possibility that the pollinator will be trapped into another flower to deposit the pollinia on the stigma. What lures the pollinator to the flower in the first place is still unknown. The specific pollinators themselves are also unknown.

After about 20 or 30 minutes, the turgor is restored in the layer of cells of the claw in contact with the column-foot resuming pressure between them, thus forcing the lip out again into the receptive position. This would permit the intruder to escape, if it had not already done so. Rain also causes the lip to snap shut, but nightfall may cause the lip to close slowly. Dawn sees the lip open again.

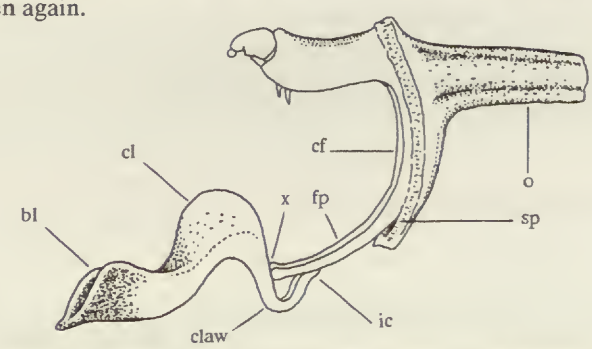

Figure 1. The lip in the open, or receptive position (*Porroglossum olivaceum*).

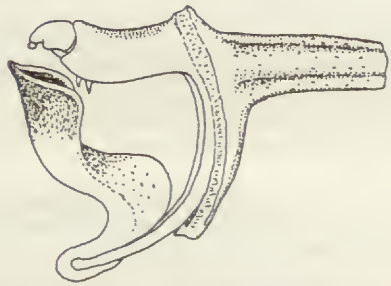

Figure 2. The lip in the closed position. The claw has slipped around the apex of the column-foot.

bl = blade of the lip; cl = callus of the lip; claw = claw of the lip; ic = insertion of the claw on the back surface of the column-foot; cf = column-foot; fp = free portion of the column-foot; o = ovary; sp = sepals and petals cut away; x = point of pressure between the outer layer of cells of the upper surface of the claw and the apex of the column-foot

KEY TO THE SUBGENERA, SECTIONS AND SPECIES OF *PORROGLOSSUM*

Subgenus *Eduardii*

1 Rhizome long-repent; raceme distantly flowered. . . . . *P. eduardii*

Subgenus *Porroglossum*

1' Plant caespitose or shortly repent; raceme densely flowered 2

2 Peduncle glabrous 4

Section *Echidna*

2' Peduncle pubescent 3

3 Sepals verrucose, the tails clavate-thickened . . . . . *P. echidna*
3' Sepals verrucose or smooth, the tails slender . . . . . *P. muscosum*

* * *

4 Flowers normally resupinate, the ovaries minimally or not twisted 8

Section *Tortae*

4' Flowers non-resupinate, the ovaries more or less twisted 5

5 Leaves reticulated; blade of the lip broadly cuneate, pubescent 6
5' Leaves not reticulated; blade of the lip narrowly to broadly cuneate 7

6 Tails of the lateral sepals ca. 7 mm long, descending . . . . . *P. portillae*
6' Tails of the lateral sepals ca. 2 mm long, ascending . . . . . *P. uxorium*

7 Tails of the lateral sepals ca. 4 mm long, descending; blade of the lip narrowly cuneate, glabrous . . . . . *P. dalstroemii*
7' Tails of the lateral sepals subglobose, 1.5-2 mm long and broad; blade of the lip broadly cuneate, ciliate . . . . . *P. condylosepalum*

Section *Porroglossum*

8 All three sepals tailless, the lateral sepals triangular, subacute . . . . . *P. hirtzii*
8' Lateral sepals distinctly narrowed or with tails 9

9 Dorsal sepal verrucose, narrowly obtuse without contracting into a tail 10
9' Dorsal sepal not verrucose, contracted into a distinct tail, long or short 11

10 Apex of the lateral sepals apical, distant from the junction with the dorsal sepal, the margins erose ..... *P. mordax*
10' Apex of the lateral sepals lateral, adjacent to the junction with the dorsal sepal, the margins entire ..... *P. lycinum*

11 Tail of the dorsal sepal slender, acute, shorter than the blade, usually acutely reflexed 12
11' Tail of the dorsal sepal slender or stout, about as long as or longer than the blade 16

12 Tails of the lateral sepals thickened-clavate 13
12' Tails of the lateral sepals slender 15

13 Leaves reticulated; flowers small, the tails of the lateral sepals ca. 5 mm long, the blade of the lip 3 mm long ..... *P. rodrigoi*
13' Leaves not reticulated; flowers larger, the tails of the lateral sepals ca. 10 mm long, the blade of the lip 5 mm long 14

14 Sepals white; blade of the lip minutely pubescent ..... *P. nutibara*
14' Sepals orange; blade of the lip glabrous ..... *P. aureum*

15 Sepals bright rose; callus of the lip low ..... *P. amethystinum*
15' Sepals brown; callus of the lip tall, longitudinal ..... *P. olivaceum*

16 Tail of the dorsal sepal slender, more or less reflexed 17
16' Tail of the dorsal sepal thick, more or less erect or antrorse 22

17 Sepals rose to bright rose; tail of the dorsal sepal acutely reflexed; callus of the lip longitudinal 18
17' Sepals not rose; tail of the dorsal sepal slightly reflexed; callus of the lip longitudinal or transverse 20

18 Sepals pubescent within ..... *P. sergioi*
18' Sepals glabrous 19

19 Dorsal sepal broadly transversely dilated; petals with acute marginal angles ..... *P. hoeijeri*
19' Dorsal sepal not broadly dilated; petals with obtuse marginal angles ..... *P. teaguei*

20 Callus of the lip tall and longitudinal ..... *P. taylorianum*
20' Callus of the lip low and transverse 21

21 Leaves verrucose; callus of the lip densely pubescent ..... *P. agile*
21' Leaves not verrucose; callus of the lip glabrous ..... *P. schramii*

22 Tail of the dorsal sepal erect; callus of the lip low, longitudinal and flat; stigma with acute processes 23
22' Tail of the dorsal sepal antrorse; callus of the lip short and transverse; stigma without acute processes 24

23 Lateral sepals abruptly contracted into narrow, terete, laterally ascending tails ..... *P. procul*
23' Lateral sepals gradually narrowed into broad, decurved tails ..... *P. andreettae*

24 Blade of the lip pubescent ..... *P. meridionale*
24' Blade of the lip glabrous ..... *P. peruvianum*

LIST OF ILLUSTRATIONS

Porroglossum agile Luer	Plate 1.
Porroglossum amethystinum (Rchb. f.) Garay	Plate 2.
Porroglossum andreettae Luer	Plate 3.
Porroglossum aureum Luer	Plate 4.
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Porroglossum meridionale P. Ortiz	Plate 12.
Porroglossum mordax (Rchb. f.) Sweet	Plate 13.
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Porroglossum sergioi P. Ortiz	Plate 27.
Porroglossum taylorianum Luer	Plate 28.
Porroglossum teaguei Luer	Plate 29.
Porroglossum uxorium Luer	Plate 30.

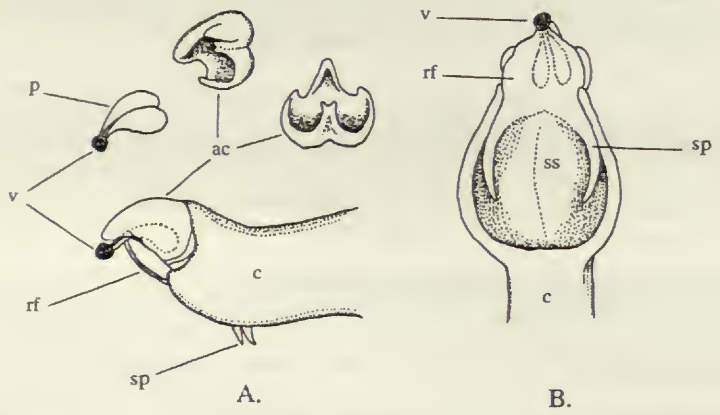


Figure 3. A. Column, side view. B. Column, bottom view.

ac = anther cap; p = pollinium; v = viscidium; c = column; rf = rostellar flap (from the stigma); ss = stigma, receptive surface; sp = stigmatic process

Porroglossum Schltr.

Porroglossum Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 82, 1920.

Type: *Porroglossum colombianum* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 83, 1920. (*Masdevallia mordax* Rchb. f.) [*Porroglossum mordax* (Rchb. f.) Sweet]

Ety.: From the Greek *porro*, "far, far off," and *glossa*, "tongue," referring to the distant position of the lip held from the column by an elongated column-foot.

Plants perennial, small to large, epiphytic to terrestrial, the rhizome very short to elongate between aerial stems (ramicauls); roots few to many, slender to coarse or fleshy. Ramicauls ascending to erect, slender to stout, nonpseudobulbous, shorter than the leaf, unifoliate, partially or completely enclosed by 2-3 imbricating sheaths about the base, the inflorescence emerging laterally with an annulus from near the base. Leaf erect, coriaceous, smooth to verrucose, sometimes suffused with purple, sometimes reticulated, petiolate, the blade elliptical or narrowly elliptical to narrowly obovate, acute to obtuse, apiculate, the base cuneate or narrowly cuneate into the petiole. Inflorescence racemose, dense, rarely lax, successively few- to several-flowered, resupinate or non-resupinate, borne by an erect to horizontal, slender to stout, glabrous to long-pubescent peduncle, with 1-4 bracts; floral bracts thin, tubular, often imbricating; pedicels slender to stout; ovary smooth, verrucose to papillose, sometimes twisted; sepals membranous to fleshy, variously colored, smooth to verrucose or pubescent, connate to near the middle to form a sepaline cup, the apices usually contracted into short or long, broad or slender, sometimes clavate tails; petals small, cartilaginous, oblong, the obtuse apex often clavate, the margins often angled below the middle; lip spathulate, the blade smooth to pubescent, obtriangular or obovate with a longitudinal callus or a short, transverse callus at the base above a narrow claw bent around the free apex of the column-foot, and attached to the posterior surface of the column-foot; column short, semiterete, more or less broadly winged, the exposed anther and rostellum apical, the pollinia 2, pyriform, attached to a common viscidium, the stigma broad and ventral, sometimes with a prominent pair of acute, descending, lateral processes (Figure 3.), the base of the column modified into a long, curved foot with the apical portion free.

Except for *Porroglossum eduardii*, the species of *Porroglossum* are closely allied. *Porroglossum eduardii*, differing from all the others in the long-repent rhizome, the distantly flowered raceme with more than one flower open at a time, and the sepals verrucose within, is segregated into a monotypic subgenus.

All the other species constituting subgenus *Porroglossum* are subdivided into three sections: *Echidnae* for those species with a pubescent peduncle, *Tortae* for those species with a normally non-resupinate flower, and *Porroglossum* for all the remaining species characterized by a caespitose habit, and a glabrous peduncle bearing resupinate flowers.

Porroglossum subgen. **Eduardia** Luer, subgen. nov.

Bas.: *Masdevallia eduardii* Rchb. f., Gard. Chron. 2: 778, 1880.
[*Porroglossum eduardii* (Rchb. f.) Sweet]
Ety.: Named for the professional collector, Eduard Klaboch, who discovered this species.

Plantae longirepentes. Racemi laxiflori. Sepala intus verrucosa.

This monotypic subgenus is characterized by the long-repent rhizome, loosely flowered racemes, and orange, tailless sepals verrucose within. The callus at the base of the blade of the lip is transverse and erect. As far as known, *Porroglossum eduardii* is restricted to one valley in southwestern Colombia.

Porroglossum subgen. **Porroglossum**

Type: *Porroglossum colombianum* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 83, 1920.
(*Masdevallia mordax* Rchb. f.) [*Porroglossum mordax* (Rchb. f.) Sweet]

Except for *Porroglossum eduardii*, all the species of the genus are included in subgenus *Porroglossum*. It is subdivided into three sections: *Echidnae, Porroglossum* and *Tortae*.

Porroglossum subgen. **Porroglossum** sect. **Echidnae** (Rchb. f.) Luer, comb. nov.

Bas.: *Masdevallia* sect. *Echidnae* Rchb. f., Linnaea 41: 11, 1877.
Type: *Masdevallia echidna* Rchb. f., Bonplandia 3: 69, 1855.
[*Porroglossum echidna* (Rchb. f.) Garay, as *echidnum*]
Ety.: From the Greek *echidna*, "an adder, or a viper," or "the spiny anteater," referring to the prickly peduncle.

Syn.: *Masdevallia* sect. *Echidna* Krzl., Repert. Spec. Nov. Regni Veg. Beih. 34: 186, 1925.

Syn.: *Masdevallia* sect. *Muscosae* Woolw., The Genus Masdevallia sect. VII, 1896.
Type: *Masdevallia muscosa* Rchb. f., Gard. Chron. 1: 460, 1875.
[*Porroglossum muscosum* (Rchb. f.) Schltr.]
Ety.: From the Latin *muscosus*, "mossy," referring to the mosslike hairs of the peduncle.

When Reichenbach described *Masdevallia erinacea*, he attributed it to *Echidnae*, an unspecified subgeneric category, presumably a section typified by *M. echidna*. *Masdevallia echidna* is distinguished by the bristly peduncles, possibly a defense against climbing vermin who would steal pollinia or devour the flower. These peduncles have been compared to pipe cleaners. The callus of the blade of the lip is a longitudinal lamina; the stigma lacks acute processes. Reichenbach (1861) compared his totally unrelated *M. verrucosa* and *M. ochthodes* to *M. echidna* because of the similar habit and asperity of the peduncles. The last two epithets were subsequently removed from *Masdevallia* to *Scaphosepalum* by Pfitzer in 1888.

The two recognized species of this section are very closely allied, possibly merely representing two forms of a widespread, variable species frequent in the Andes from Venezuela through Ecuador. Three epithets of *Porroglossum* belong here (*echidna, muscosum,* and *xipheres*).

Porroglossum subgen. **Porroglossum** sect. **Porroglossum**

Type: *Porroglossum colombianum* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7:83, 1920. (*Masdevallia mordax* Rchb. f.) [*Porroglossum mordax* (Rchb. f.) Sweet]

Syn.: *Lothiania* Krzl., Gard. Chron. ser. 3, 75: 173, 1924.
Type: *Lothiania mordax* (Rchb. f.) Krzl., Gard. Chron. ser. 3, 75: 173, 1924. (*Masdevallia mordax* Rchb. f.) [*Porroglossum mordax* (Rchb. f.) Sweet]
Ety.: Named in honor of the Marquess of Lothian, orchid enthusiast of Newbattle Abbey.

The bulk of the species of the genus are included in section *Porroglossum*. Most are closely allied. They are distinguished from each other by the reticulation of the leaves, the color of the sepals, the tails of the sepals, and the shapes of the callus of the blade of the lip. The stigmas of some species bear a pair of acute, toothlike processes, others do not.

Porroglossum subgen. **Porroglossum** sect. **Tortae** Luer, sect. nov.

Type: *Porroglossum portillae* Luer, Phytologia 47: 81, 1980.
Ety.: From the Latin *torta*, "a torsion," referring to the twist of the ovary.

Flores inversi. Ovaria torta.

This section of four allied species (*P. condylosepalum, P. dalstroemii, P. portillae and P. uxorium*) from eastern and southeastern Ecuador is characterized by the non-resupinate flowers. The lips are borne uppermost through a 180 to a 360 degree twist of the ovary, depending upon the position of the pedicel or the peduncle. The callus of the blade of the lip is low with an elevation at the base; the stigma possesses a pair of toothlike processes. The pedicel of the resupinate flowers of the genus bends backward without or with a minimal twist of the ovary to place the lip lowermost.

Porroglossum agile Luer, Phytologia 46: 374, 1980.

Ety.: From the Latin *agilis*, "quick, nimble," referring to the rapid and repeated action of the lip.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5-10 mm long, enclosed by 2-3 white, tubular sheaths. Leaf erect, thickly coriaceous, verrucose, petiolate, 3.5-7 cm long including the petiole 1.5-3.5 cm long, the blade narrowly obovate, subacute, 8-11 mm wide, narrowly cuneate below into the petiole. Inflorescence a congested, successively flowering raceme, borne by an erect, slender, glabrous peduncle 8-10 cm long, with a few distant bracts, from low on the ramicaul; floral bract tubular, 5 mm long; pedicel 5 mm long; ovary subverrucose, 4-6 mm long; sepals translucent light yellow with bright yellow veins, glabrous, 3-costate externally, the dorsal sepal obovate, 7 mm long, 5 mm wide, connate to the lateral sepals for 3.5 mm to form a gaping cup, the apex obtuse to rounded, abruptly contracted into a slender, reflexed tail 8 mm long, the lateral sepals ovate, oblique, acute, 7 mm long, 7 mm wide at the base, connate 2.5 mm to each other and to the column-foot to form a deep mentum, the apices contracted into slender, decurved tails ca. 6 mm long; petals translucent yellow with a brown midvein, oblong, 5 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins obscurely obtusely angled below the middle; lip white, the blade obtriangular, with purple flecks and spicules above the middle, 4.5 mm long, 4 mm wide, with an erect, transverse, more or less pyramidal, densely pubescent callus at the base, the truncate apex with a short, obtuse, sulcate apiculum, the base extended into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the slender foot 4 mm long.

PERU: Dept. of Junín: epiphytic near Chanchamayo, collected by J. Meza, flowered in cultivation by W. Königer in München, 20 May 1980, *C. Luer 5254* (Holotype: SEL).

This species was obtained by W. Königer from Jorge Meza T. who reportedly discovered the plants in the Chanchamayo valley of central Peru. Plants later flowered in cultivation in Munich, Germany, where the species is still in cultivation. It is not known from any other collection.

Superficially the flowers of *Porroglossum agile* appear similar to those of the widespread *P. muscosum* (Rchb. f.) Schltr., but *P. agile* is readily distinguished by the glabrous peduncle. The densely pubescent, pyramidal callus of the base of the blade of the lip is similar to that of the thick-tailed *P. meridionale* Ortiz, also from Peru.

The species is named for the unusually rapid recovery of the lip to the open or receptive position after having been stimulated to rise into the closed position. Instead of 20 or 30 minutes, the lip often descends after less than five minutes, but after three or four trips, the mechanism seems to become fatigued.

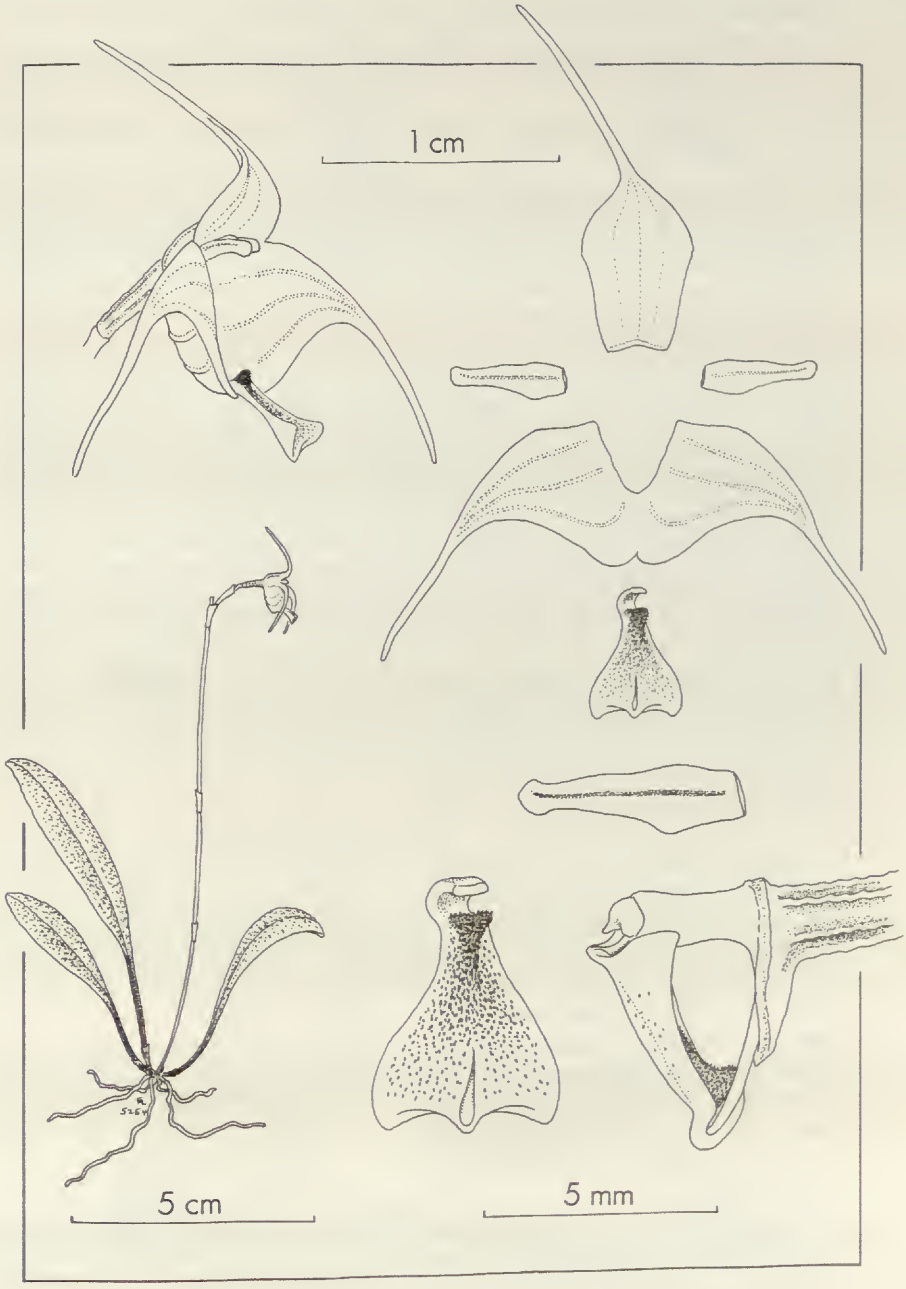


Plate 1. *Porroglossum agile* Luer

Porroglossum amethystinum (Rchb. f.) Garay, Bot. Mus. Leafl. 21: 251, 1967.

Bas.: *Masdevallia amethystina* Rchb. f., Otia Bot. Hamburgensia 1: 14, 1878.

Ety.: From the Latin *amethystinus*, "amethyst-colored," referring to the bright rose color of the flowers.

Syn.: *Scaphosepalum amethystinum* (Rchb. f.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 119, 1921.

Plant medium in size, epiphytic to terrestrial, caespitose; roots slender. Ramicauls erect, slender, 10-15 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 5-10 cm long including the petiole 3-4 cm long, the blade narrowly obovate, acute to subacute, 10-14 mm wide, gradually narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by a very slender, erect to suberect, glabrous peduncle 15-25 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 3-10 mm long; pedicel 8-12 mm long; ovary subverrucose, 3-4 mm long; sepals bright rose, glabrous, the dorsal sepal transversely obovate 4-5 mm long, 6-7 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex reflexed, abruptly short-acuminate with a tail ca. 2 mm long, the lateral sepals oblong, oblique, 7-9 mm long, 6-7 mm wide, connate 3.5 mm to form an acute mentum below the column-foot, the apices oblique, obtuse, contracted into slender, orange tails sometimes slightly thickened apically, 8-14 mm long; petals translucent with a brown midvein, ovate, 3.5 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins obtusely angled near the middle; lip white, suffused and dotted with dark purple, the blade cuneate, 4 mm long, 3.5-4 mm wide, thickened toward the base, the apex purple-black, broadly obtuse, shortly acuminate with a shallow, midline sulcus, the base deflexed into a slender, strap-like claw bent with tension about the free apex of the column-foot; column stout, semi-terete, 2 mm long, the slender, curved foot 5 mm long, the stigma with a pair of pointed processes.

ECUADOR: Prov. of Pichincha: western Andes, 1869, *Jameson s.n.* (Holotype: W; Isotype: K); terrestrial on a road embankment west of Chiriboga between Quito and Santo Domingo, alt. 2000 m, 26 Oct. 1961, *C. H. Dodson & L. B. Thien 1123* (MO, SEL); same area, 10 Mar. 1975, *C. Luer & R. Kent 215* (SEL).

Dried specimens of this species were first collected by Dr. Jameson in the "western Andes," undoubtedly on the lush, forested slopes west of Quito in the province of Pichincha where he lived. It is still locally abundant in this area where it is endemic. It often grows in large numbers on the clay road embankments in company with the many other species of orchids found in that area that are early but temporary colonists of road-cuts.

The peduncles of *P. amethystinum* seem unusually long and slender, often bending with the weight of the raceme at the tip. The flowers, normally resupinate, are bright rose in color and the apex of the lip is purple-black. Sometimes the pedicel bends incompletely, thus bearing the flower with the lip more or less uppermost. The tail of the dorsal sepal is short and acutely reflexed; the tails of the lateral sepals are long and filiform. The callus at the base of the lip is low and smooth.

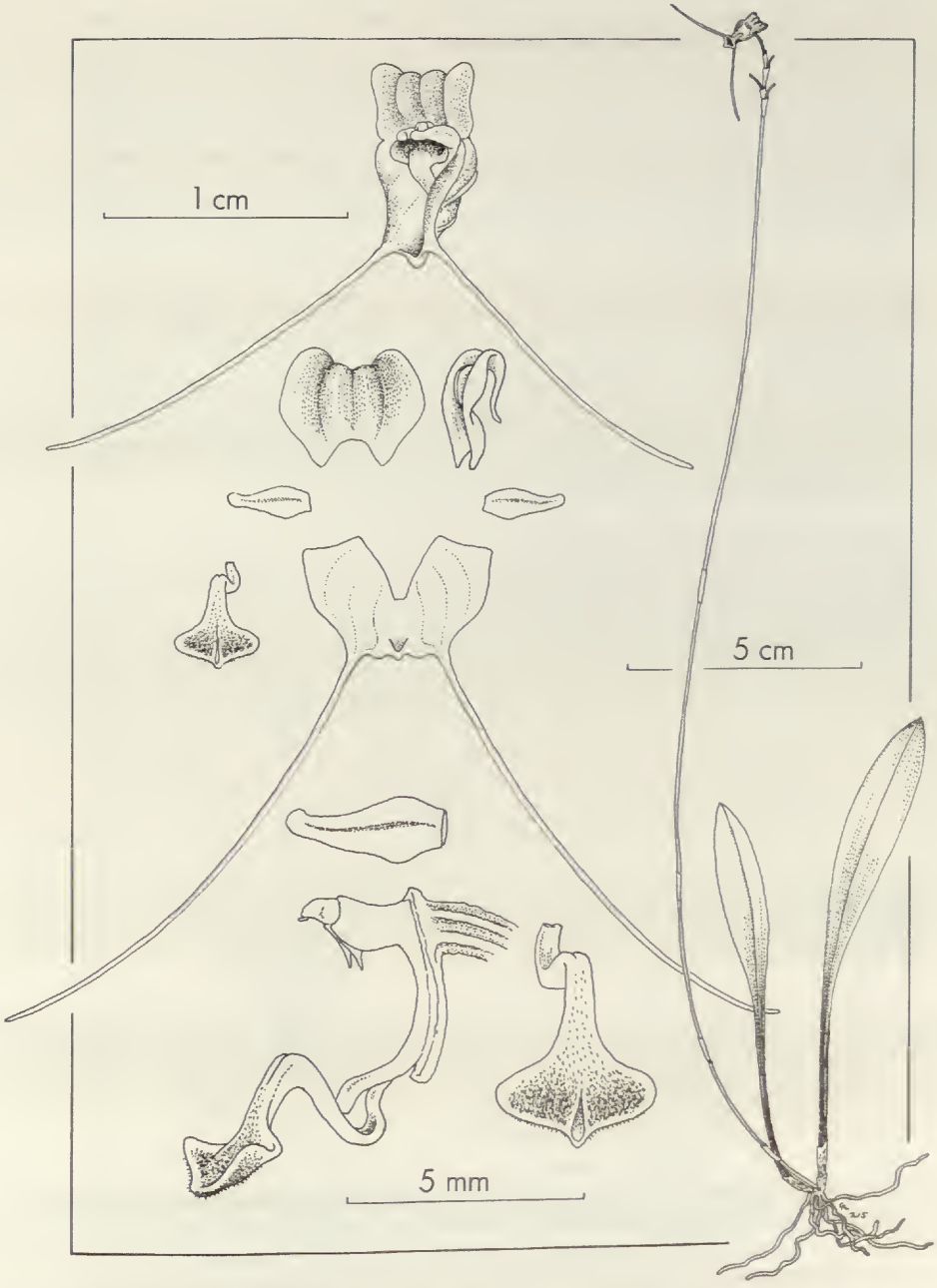


Plate 2. *Porroglossum amethystinum* (Rchb. f.) Garay

Porroglossum andreettae Luer, Phytologia 46: 375, 1980.

Ety.: Named in honor of Angel Andreetta, Salesian Padre of Paute, Ecuador, formerly from Bomboiza, who discovered this species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, ca. 1 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, minutely verrucose to nearly smooth, petiolate, 2.5-4 cm long including the petiole 1-2 cm long, the blade narrowly obovate, subacute, 6-8 mm wide, gradually narrowed below into an indistinct petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, slender, glabrous peduncle 4-6.5 cm long, with a bract near the middle, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 5 mm long; ovary subverrucose, 4 mm long; sepals yellow, veined and suffused with brown, microscopically pubescent within, the dorsal sepal obovate, 6 mm long, 4 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex obtuse, contracted into a thick, suberect tail 4 mm long, the lateral sepals falcate, 10 mm long, 5 mm wide at the base, nearly free from each other but connate to the column-foot to form a deep mentum, the apices oblique, acute; petals translucent yellow with a brown midvein, oblong, 4.5 mm long, 2 mm wide, narrowed to the slightly dilated, rounded apex, the lower margin with a subacute angle near the middle; lip yellow with a few purple flecks near the base, glabrous, the blade obovate-obtriangular, 4.5 mm long, 2.5 mm wide, longitudi-nally thickened without a well-developed callus, the truncate apex with a shallowly concave apiculum, the base extended into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the stout foot 5 mm long, the stigma with a pair of short, pointed processes.

ECUADOR: Prov. of Morona-Santiago: epiphytic in forest along Río Calagrás, alt. 1500 m, Oct. 1977, A. Andreetta, L. Carollo & M. Portilla 1714, flowered in cultivation by Padre Andreetta in Cuenca, 8 Nov. 1979, *C. Luer 4695* (Holotype: SEL).

This little species was discovered by Padre Andreetta and companions in the rich, tall, rain forest along the Río Calagrás when the trees were first being cut for the new road south to Gualaquiza. *Porroglossum andreettae* remains rare, having been collected but once. The few plants in cultivation are from the original collection.

Porroglossum andreettae is recognized by the little, light greenish flower with short, broad tails of the sepals, about as long as the blades themselves. The apices of the lateral sepals curve outward and downward. The glabrous blade of the lip lacks a well-developed callus.

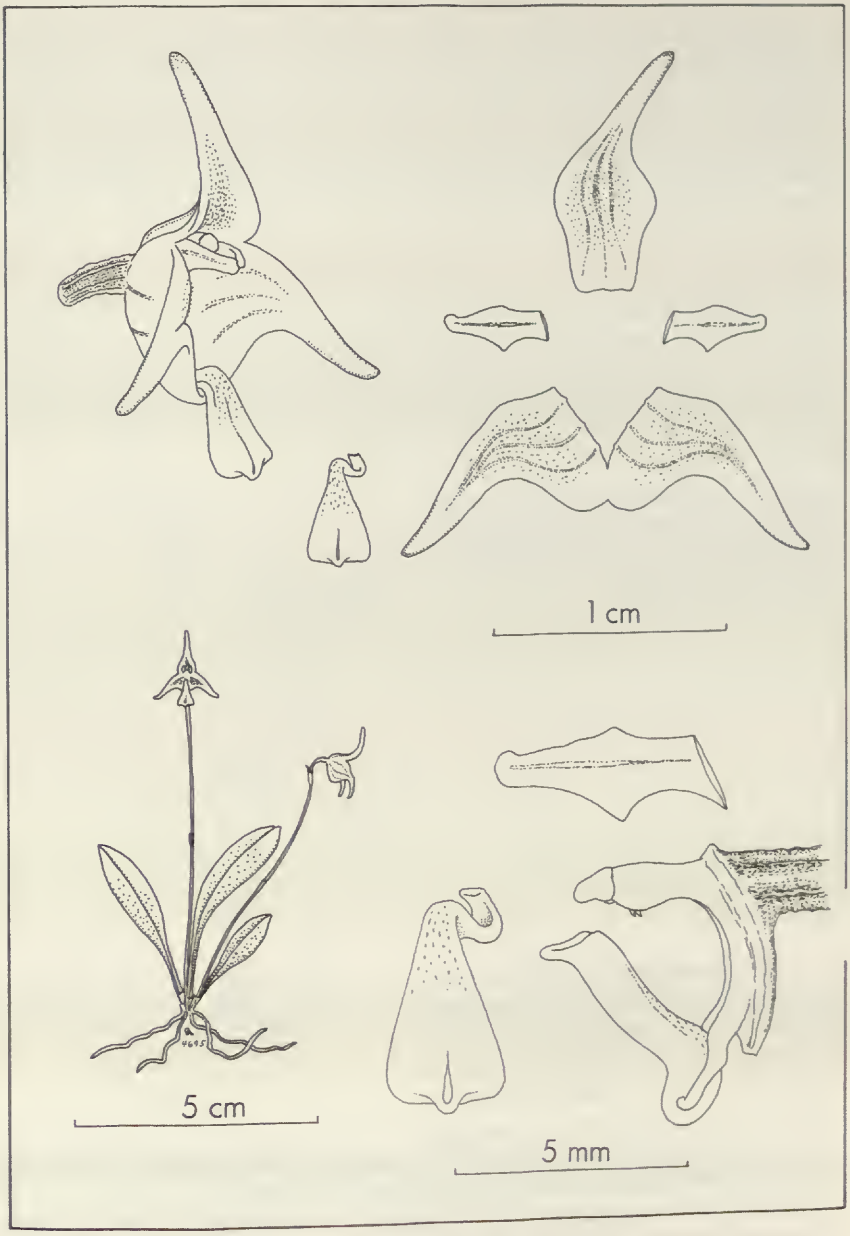


Plate 3. *Porroglossum andreettae* Luer

Porroglossum aureum Luer, Phytologia 46: 376, 1980.

Ety.: From the Latin *aureus*, "golden yellow," in reference to the color of the flowers.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5-10 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, subverrucose, long-petiolate, 5-6 cm long including the petiole 2-3 cm long, the blade narrowly obovate, subacute, 9-10 mm wide, gradually narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, slender, glabrous peduncle 12-13 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bract tubular, imbricating, 5 mm long; pedicel 6-8 mm long; ovary 3-4 mm long; sepals bright yellow with darker yellow veins and tails, the dorsal sepal transversely obovate with rounded lateral margins, 5 mm long, 6.25 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex reflexed, abruptly short-acuminate with a tail ca. 2 mm long; the lateral sepals transversely ovate, oblique, 4 mm long, 7 mm wide, connate 3.5 mm to form an acute mentum below the column-foot, the apices oblique, acute, contracted into slender tails thickened along the middle, ca. 10 mm long; petals translucent yellow with a dark yellow midvein, oblong, 3.5 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins obtusely angled near the middle; lip yellow, glabrous, the blade cuneate, 5 mm long, 3.5 mm wide, broadly thickened toward the tall, callous-thickened base, the apex broadly obtuse, shortly acuminate with a shallow, midline sulcus, the base deflexed into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 1.5 mm long, the slender, curved foot 5 mm long, the stigma with a pair of pointed processes.

ECUADOR: Prov. of Carchi: epiphytic in cloud forest above Maldonado, alt. ca. 2500 m, July 1977, collected by W. Teague, flowered in cultivation in San Francisco, 5 July 1980, *C. Luer 5298* (Holotype: SEL).

This showy, golden yellow-flowered species, known only from the type collection, was discovered by Walter Teague in the valley above Maldonado in northwesternmost Ecuador during the first years that the road was opened. For several years it was cultivated successfully in San Francisco, but eventually the plant died. To date, it has not been rediscovered.

Porroglossum aureum is readily distinguished by the bright color, no other species of the genus displaying this uniform golden yellow. It is the same rich color as that of the Peruvian *Masdevallia davisii* Rchb. f. The tail of the dorsal sepal is short and reflexed; the long tails of the lateral sepals are thickened below the apex. The lip is glabrous with a tall, thick callus above the base of the blade.

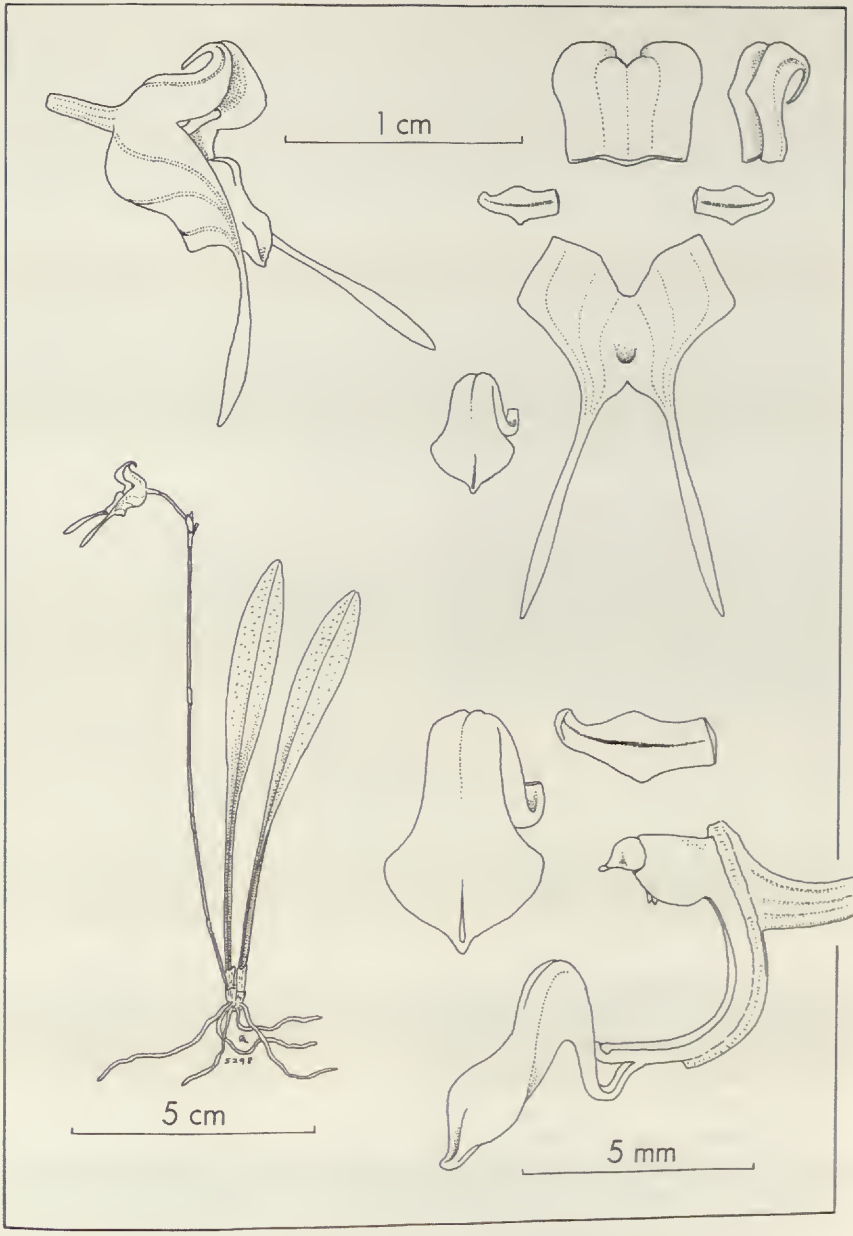


Plate 4. *Porroglossum aureum* Luer

Porroglossum condylosepalum Sweet, Orquideología 10: 212, 1975.

Ety.: From the Greek *kondylos*, "a knuckle," and *sepalon*, "a sepal," referring to the knoblike apices of the sepals.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 8-13 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 2.5-6.5 cm long including the petiole 1-3 cm long, the blade narrowly obovate, subacute, 8-11 mm wide, gradually narrowed below into the slender petiole. Inflorescence a congested, successively few-flowered raceme, the flowers non-resupinate, borne by a suberect to horizontal, slender, glabrous peduncle 6-8 cm long, with a few, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 4 mm long; ovary subverrucose, 4-5 mm long, usually twisted 180 degrees; sepals similar, translucent dull rose, flecked with purple, with the veins prominent externally, microscopically pubescent within, ovate, concave, 6 mm long, 5 mm wide, connate to each other for 2.5 mm to form a gaping, suborbicular cup, the obtuse apices yellow, contracted into broadly rounded and thickened "tails" 1.5-2 mm wide and long; petals translucent light dull purple with purple dots and midvein, oblong-ovate, 3.25 mm long, 1.75 mm wide, narrowed to the slightly dilated, rounded apex, the upper margin with an obtuse angle below the middle, the lower margin with an acute angle below the middle; lip light dull gray with a purple flecks near the base, the blade cuneate, 4 mm long, 3 mm wide, the truncate apex pubescent, with an obtuse, sulcate apiculum, the base thickened with a low, obscurely bilobed callus above the straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the stout foot 4 mm long, the stigma with two short, pointed processes.

ECUADOR: Prov. of Tungurahua: near the village of Río Negro, 9 Nov. 1952, *F. Fagerlind & B. Wibom 1257* (Holotype: S); same area, collected by J. Brenner, flowered in cultivation at Puyo, 1 Aug. 1977, *C. Luer 1792* (SEL); Prov. of Pastaza: epiphytic in forest near Mera, alt. 1400 m, collected by A. Hirtz 1659, flowered in cultivation in Quito, 8 April 1984, *C. Luer 10023* (MO); same area, 10 Jan. 1986, *S. Dalström & T. Höijer 1018* (MO).

This little species was first collected by the Swedish collectors Fagerlind and Wibom near the community of Río Negro north of Baños, near the present site of the new hydroelectric dam on the Río Pastaza. It is apparently endemic in this system of valleys in eastern central Ecuador at relatively low altitudes between 1000 and 1400 meters above sea level, having been found on several occasions.

Porroglossum condylosepalum is easily recognized by the short, thick, rounded "tails" of all three sepals, broader and shorter than those of *P. uxorium* Luer, its closest relative, from southeastern Ecuador where two more relatives (*P. dalstroemii* and *P. portillae*) are also to be found. The flowers of all four species are non-resupinate.

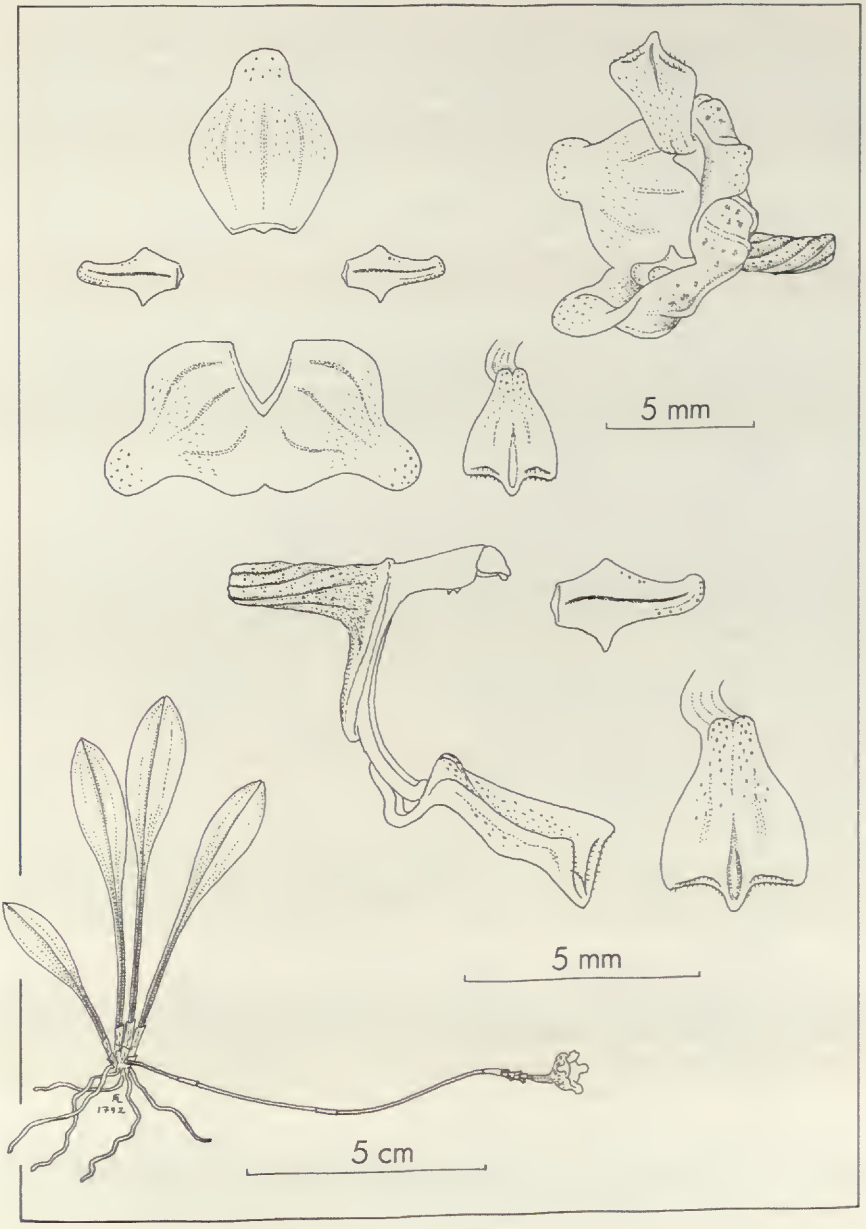


Plate 5. *Porroglossum condylosepalum* Sweet

Porroglossum dalstroemii Luer, sp. nov.

Ety.: Named in honor of Stig Dalström of Borlänge, Sweden, who, with Thomas Höijer, discovered this species.

Planta mediocris caespitosa, pedunculo erecto folio longipetiolato multilongiore, flore mediocri nonresupinato purpureoguttulato glabro, ovario torto, sepalo impari oblongo concavo cum cauda brevi crassissima, sepalis lateralibus transverse oblongis obtusis cum caudis brevibus crassissimis, petalis oblongis clavatis marginibus ambabus cum dente acuto, lamina labelli crassa anguste cuneata truncata sulcata angulis lateralibus obtusis callo basali humili.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 10-15 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 3.5-5.5 cm long including the blackish petiole 1.5-2 cm long, the blade elliptical, obtuse to subacute, 10-14 mm wide, the base cuneate into the slender petiole. Inflorescence a congested, successively few-flowered raceme, the flowers non-resupinate, borne by an ascending to erect, smooth, slender peduncle 9-12 cm long, with 2 closely applied, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5-6 mm long; pedicel 5-6 mm long; ovary twisted, pitted, 4 mm long; sepals rose, diffusely dotted with purple, glabrous, the middle sepal oblong, deeply concave, 5 mm long, 4 mm wide unexpanded, connate to the lateral sepals for 3 mm, the obtuse apex contracted into a 3 mm long, 1 mm thick, descending tail, the lateral sepals transversely oblong, 5 mm long, 7 mm wide, connate to each other 3.5 mm behind the free apex of the column-foot, the broadly obtuse apices abruptly contracted into obliquely descending, terete tails 4 mm long; petals rose, ovate-oblong, 4 mm long, 1 mm wide, narrowed below the thickened, dilated apex, both margins with an acute process in the middle third; lip uppermost, rose, flecked with purple, the blade thick, narrowly cuneate, sulcate, truncate, 5 mm long, 2.75 mm wide, the lateral angles obtuse, the apex a short, obtuse, sulcate apiculum, the base with a low, transverse callus, deflexed below into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the foot 4 mm long, the stigma with a pair of pointed processes.

ECUADOR: Prov. of Morona-Santiago: epiphytic in mossy cloud forest north of Gualaquiza, alt. 1800 m, 30 Jan. 1986, *S. Dalström & T. Höijer 1119* (Holotype: MO), C. Luer illustr. 11698; without locality, collected by Mario Portilla, flowered in cultivation at Hostería Uzhupud near Gualacéo, 15 Feb. 1986, *C. Luer 11794* (MO).

Discovered recently in a remote cloud forest in the Oriente of southern Ecuador by the Swedish team of Dalström and Höijer, this species is related to *P. portillae* with a similarly twisted ovary and a non-resupinate flower. Most species of *Porroglossum* bear resupinate flowers that bend backward to the lip-lowermost position without twisting the ovary, but this species and *P. portillae* bear non-resupinate ("doubly resupinate") flowers by twisting the ovary 360°. The flower of *P. dalstroemii* is similarly colored but smaller than that of *P. Portillae*. The sepaline tails are much shorter and thicker, and the blade of the lip is narrowly cuneate instead of broadly cuneate, and glabrous.

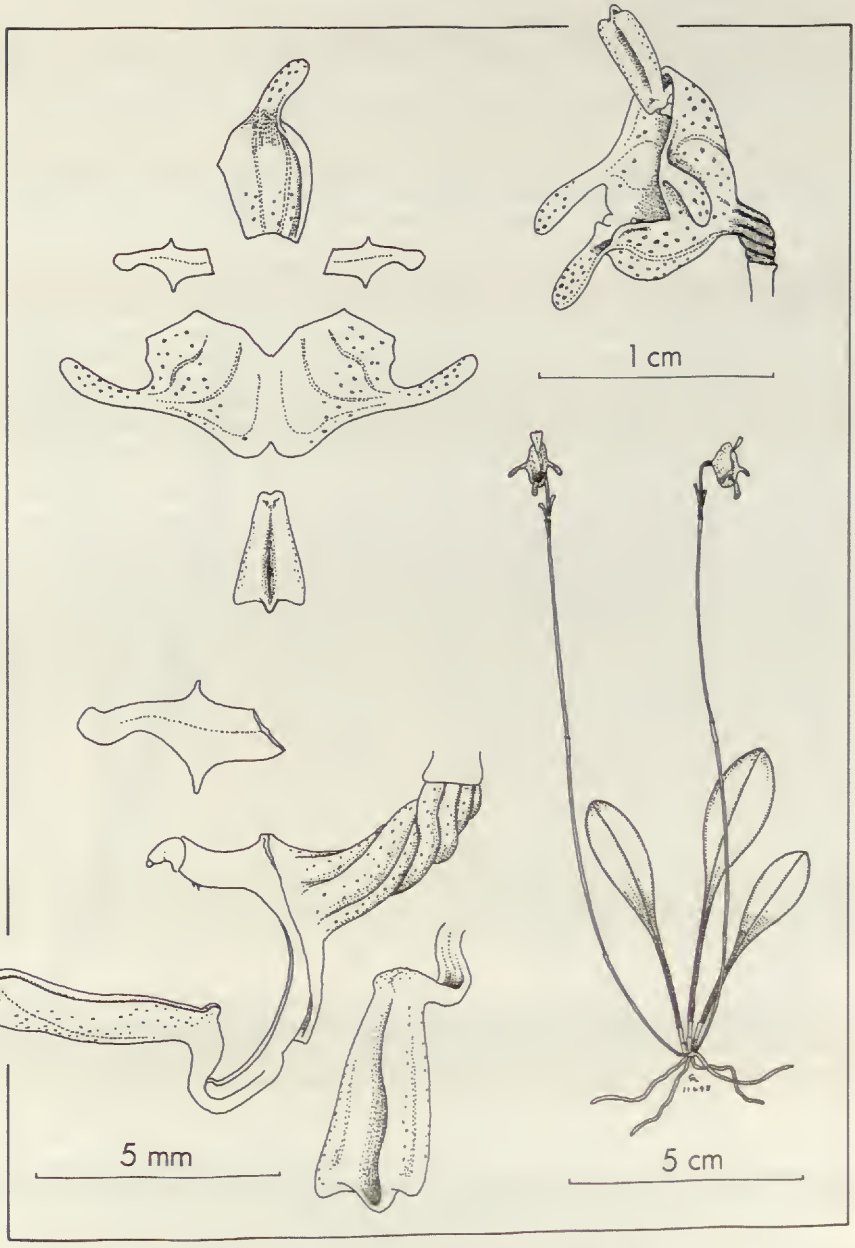


Plate 6. *Porroglossum dalstroemii* Luer

Porroglossum echidna (Rchb. f.) Garay, Svensk. Bot. Tidskr. 47: 201, 1953, as *echidnum*.

Bas.: *Masdevallia echidna* Rchb. f., Bonplandia 3: 69, 1855.

Ety.: From the Greek *echidna*, "a viper," or "the spiny anteater," in allusion to the prickly peduncle.

Syn.: *Scaphosepalum echidna* (Rchb. f.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 219, 1920.

Plant medium to large in size, epiphytic to terrestrial, shortly repent to caespitose; roots coarse, fleshy. Ramicauls stout, erect, 1.5-7 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, verrucose, petiolate, 5-14 cm long including the petiole 1.5-4 cm long, the blade narrowly elliptical to narrowly obovate, acute, 1-1.5 cm wide, gradually narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, densely long-pubescent peduncle 10-20 cm long, with a bract near the middle, from low on the ramicaul; floral bracts tubular, imbricating, 5-8 mm long; pedicel 5-10 mm long; ovary long-hispid, 5 mm long; sepals green or brown, with or without the veins suffused with brown, lightly verrucose externally, the dorsal sepal obovate, 7 mm long, 6 mm wide, connate to the lateral sepals for 5 mm to form a gaping cup, the apex obtuse, contracted into a thickened, more or less subclavate, erect to reflexed tail ca. 25 long, the lateral sepals broadly oblong, 7.5 mm long, 8 mm wide, connate to each other for 5 mm to form a deep, obtuse mentum beneath the column-foot, the apices oblique, obtuse, more or less abruptly contracted into more or less clavate-thickened recurved tails ca. 25 mm long; petals translucent tan with a brown midvein, oblong, 4 mm long, 1.3 mm wide, narrowed to the slightly dilated, rounded apex, the margins without an angle; lip light tan flecked with red, to nearly black, the blade obovate-spathulate, 8 mm long, 4 mm wide, the obtuse apex ciliate, with a shallow sulcus between a pair of rounded but flattened calli that occupy both halves of the apex, the disc with a tall, longitudinal callus above the straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 3 mm long, the stout foot 8 mm long.

COLOMBIA: old Dept. of Ocaña: Alto de San Francisco, *H. Wagener s.n.* (Holotype: W); Ocaña, without locality, *G. Kalbreyer 458* (W): Dept. of Norte de Santander: epiphytic in cloud forest, Alto de San Francisco, alt 2600 m, 11 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10256* (MO); Paramo de Jurisdicciones, alt. 3130 m, 11 Nov. 1981, *C. Luer, J. Luer, R. Escobar & D. Portillo 6561* (SEL); Dept. of Santander del Sur: epiphytic in scrubby vegetation near the pass between Bucaramanga and Berlin, alt. 3200 m, 27 Apr. 1982 *C. Luer, J. Luer, R. Escobar & D. Portillo 7607* (SEL).

This species was first discovered by Hermann Wagener near Alto de San Francisco in the old department of Ocaña along the high, mountainous trail between the two colonial towns, Ocaña and Pamplona. This area is legendary for the early collections of long-lost species of *Masdevallia* such as *M. mastodon* Rchb. f. It was not without difficulty that this critical area was eventually located by Rodrigo Escobar on an old map. Translating to a modern road map, a remote, unpaved road was found that led us past the spot. Not only was *M. mastodon* rediscovered, but *P. echidna* was there also.

This robust species is restricted to altitudes of 2500 or more meters above sea level in the Eastern Cordillera of Colombia, where it is not uncommon in the cold, subparamo forests. It is closely related to the relatively common and widespread *P. muscosum*, of lower altitudes, from which it is most readily distinguished by the clavate-thickened tails of the sepals. Except for the high altitude habitat, somewhat coarser habit, and the clavate sepaline tails, there are no other morphological features that can be relied upon to distinguish the two taxa. For details, see the discussion for *P. muscosum*.

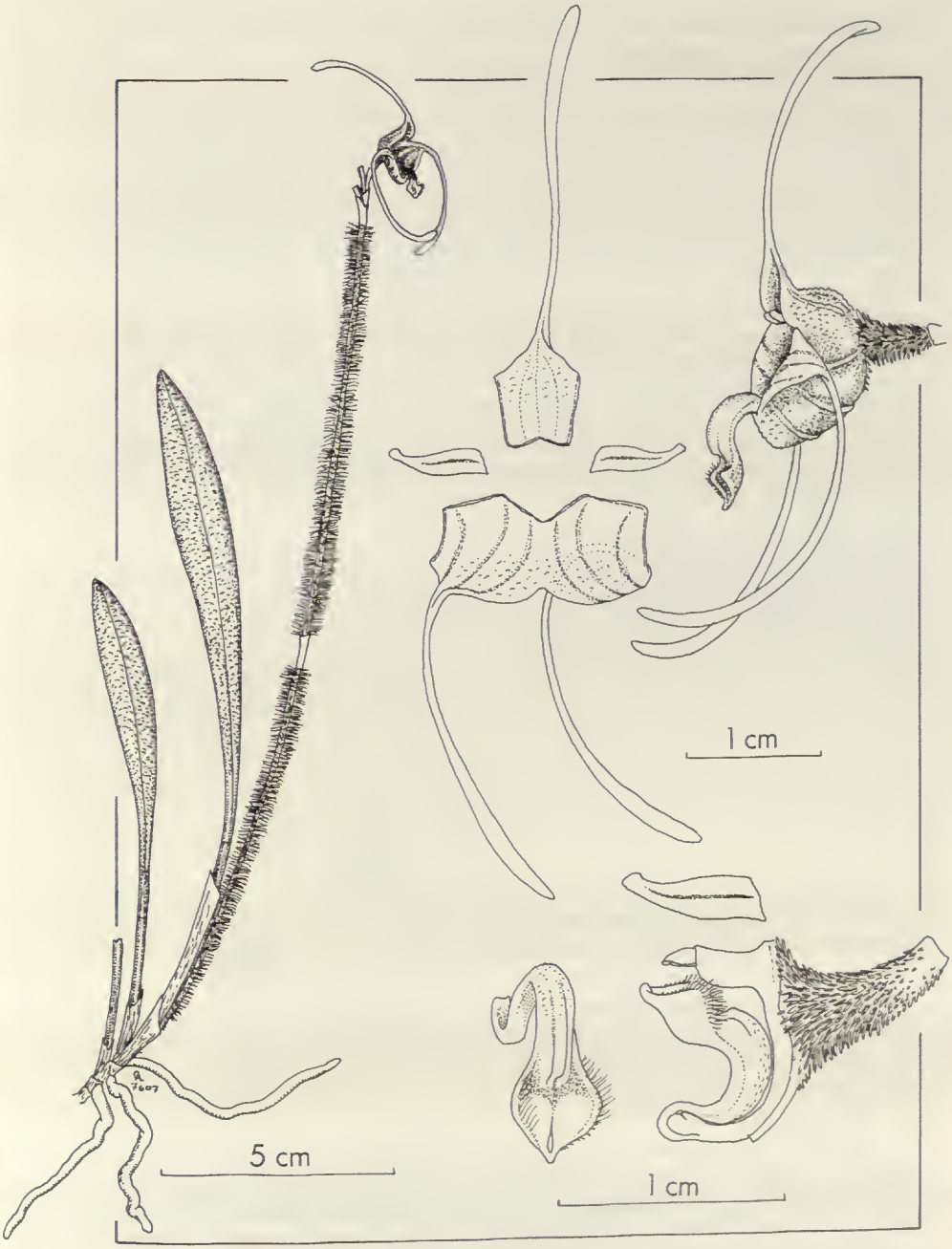


Plate 7. *Porroglossum echidna* (Rchb. f.) Garay

Porroglossum eduardii (Rchb. f.) Sweet, Amer. Orchid Soc. Bull. 41: 519, 1972.

Bas.: *Masdevallia eduardii* Rchb. f., Gard. Chron. 2: 778, 1880.

Ety.: Named in honor of its discoverer, Eduard Klaboch.

Plant medium in size, epiphytic, long-repent, the rhizome slender, 2-4.5 cm long between ramicauls; roots slender. Ramicauls erect, slender, 7-10 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, the petiole 10-20 mm long, the blade elliptical, obtuse, 18-23 mm long, 9-12 mm wide, the base cuneate into the slender petiole. Inflorescence a loose, successively few-flowered raceme, 2-3 flowers often open simultaneously, borne by an erect, slender, glabrous peduncle 15-21 cm long, with a few, distant bracts, from low on the ramicaul; floral bracts tubular, 3-4 mm long; pedicel 3-4 mm long; ovary verrucose, 4 mm long; sepals orange, with lightly erose margins, the dorsal sepal ovate, 11 mm long, 7.5 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex obtuse, with a minute apiculum, the lateral sepals oblong, 15 mm long, 6.5 mm wide, connate 8 mm, the apices rounded with a minute apiculum, the veins tall-carinate crested within above the middle; petals translucent orange, more or less oblong, 4.5 mm long, 1.75 mm wide, the apex rounded, the lower margin slightly dilated; lip orange, the blade cuneate, 4 mm long, 3 mm wide, the truncate apex pubescent, with a shallow sulcus medially, the callus at the base of the blade purple-black, transverse, erect, 1 mm tall, shortly densely pubescent, the base extended into a broad, straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the foot curved, 3 mm long.

COLOMBIA: without locality, *E. Klaboch, s.n.* (W); Dept. of Nariño: Munic. of Ricaurte, epiphytic in cloud forest at La Planada, alt. 1900 m, 28 Nov. 1976, *Olga Salazar de Benavides 727* (PSO); same area, 2 Nov. 1979, *C. Luer, J. Luer, A. Hirtz & K. Walter 4539* (SEL).

This species was first collected in Colombia without locality data by Eduard Klaboch, a professional collector employed at times by Messrs. Sanders & Co. of St. Albans, England. In describing the species in the genus *Masdevallia* in 1880, Reichenbach recognized its affinity to his *M. amethystina*.

Apparently *P. eduardii* has never been in cultivation. About a century after its original collection, an unidentified herbarium specimen collected by Dra. Olga Salazar de Benevides of the University of Pasto led to its rediscovery in 1979. It is locally abundant in a wet forest of one valley in southwestern Colombia.

Unique in the genus, this species is noted for the long-repent habit, a long, loose raceme of large, orange, tailless flowers, two or three often open simultaneously, and lateral sepals verrucose-crested within. The mechanism of the sensitive labellum is the same as in all the other members of the genus.

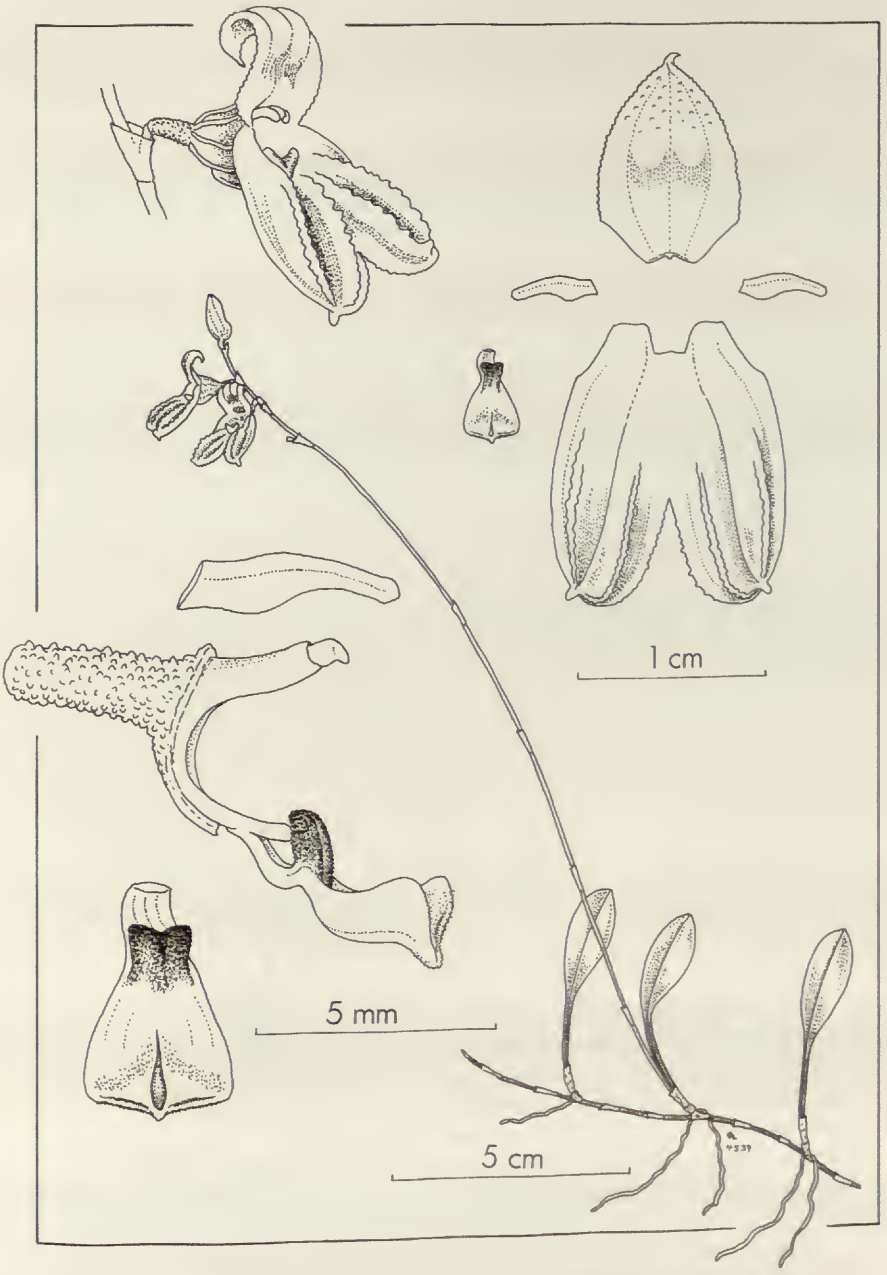


Plate 8. *Porroglossum eduardii* (Rchb. f.) Sweet

Porroglossum hirtzii Luer, sp. nov.

Ety.: Named in honor of Alexander C. Hirtz of Quito, Ecuador, who discovered this species.

Planta parva caespitosa, pedunculo erecto folio longipetiolato longiore, flore mediocri albido pubescenti, sepalo dorsali ovato supra medium convexo, sepalis lateralibus triangularibus ecaudatis, petalis integris clavatis, lamina labelli cuneata angulis lateralibus subacutis, callo basali erecto.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, ca. 5 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 4-5 cm long including the blackish petiole 1.5-2.5 cm long, the blade elliptical, obtuse to subacute, 9-11 mm wide, the base cuneate into the slender petiole. Inflorescence a congested, successively few-flowered raceme, the flowers resupinate, borne by a more or less erect, smooth, slender peduncle 7-8 cm long, with 2 closely applied, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5-6 mm long; pedicel 10-11 mm long; ovary subverrucose, 4 mm long; sepals white, lightly suffused with pale rose, sparsely long-pubescent within, the veins prominent externally, the dorsal sepal ovate, narrowly obtuse, 9.5 mm long, 4 mm wide, convex above the middle, concave below the middle, connate to the lateral sepals for 1.5 mm, the lateral sepals triangular-ovate, subacute, 10 mm long, 5.5 mm wide, connate to each other 2 mm below the attachment to the column-foot; petals white, oblong, curved, 3.75 mm long, 1.25-2.5 mm wide, narrowed in the middle third, the apex thickened, slightly dilated, rounded, the lower margin with an obtuse angle in the lower third; lip white, suffused with rose, the blade shortly pubescent, cuneate, 3.75 mm long, 4 mm wide, the lateral angles subacute, the apex obtuse, sulcate medially, the base with a low, erect, transverse callus, deflexed below into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the foot 3.5 mm long.

ECUADOR: Prov. of Morona-Santiago: epiphytic in cloud forest near Nambija, alt. 1200 m, May 1985, *A. Hirtz 2669* (Holotype: MO), C. Luer illustr. 11699.

This unusual species was recently discovered by mining engineer Alexander C. Hirtz during one of his trips to study the mineral potentialities around a gold mine in the Oriente of southern Ecuador, reminiscent of the travels and discoveries of F. C. Lehmann of the last century.

This species is unique in the genus with tailless, whitish flowers. The dorsal sepal is angled downward near the middle, convex above that point and concave below. The lateral sepals are more or less triangular with subacute apices. The clavate petals are entire. The cuneate, obtuse blade of the lip, subacutely angled laterally, has a small, erect callus at the base above the claw.

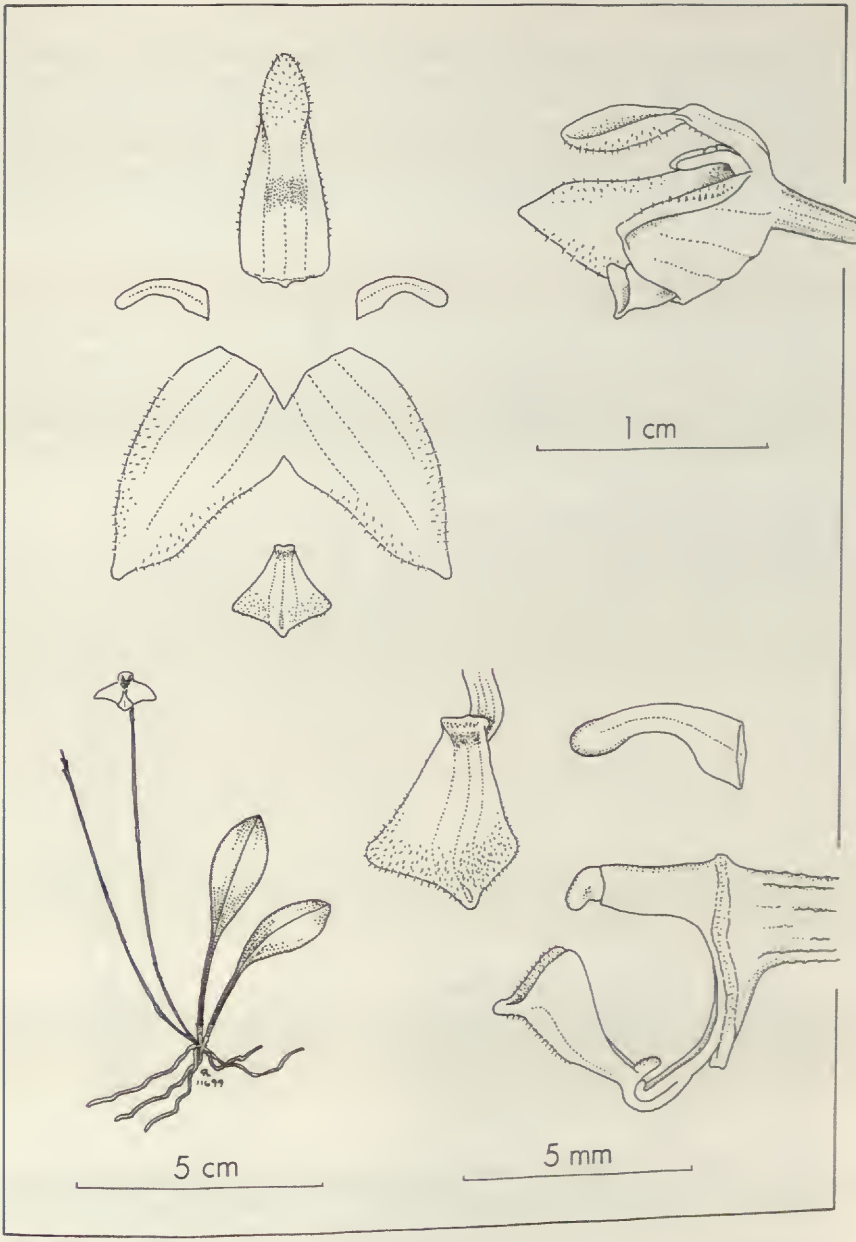


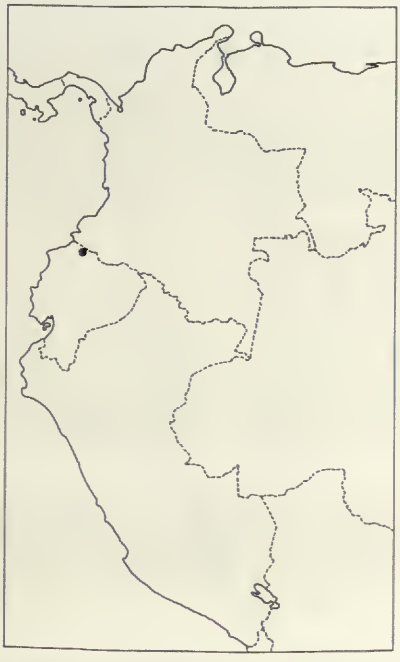
Plate 9. *Porroglossum hirtzii* Luer

Porroglossum hoeijeri Luer, Orchideer 6: 7, 1985.

Ety.: Named in honor of Thomas Höijer of Jarfalla (Stockholm), Sweden, who discovered this species.

Plant medium in size, epiphytic to terrestrial, caespitose; roots slender. Ramicauls blackish, erect, slender, 15-20 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 5-8 cm long including the petiole 2-3 cm long, the blade narrowly obovate, subacute, 0.8-1 cm wide, gradually narrowed below into the slender petiole. Inflorescence a congested, successively few-flowered raceme, borne by a very slender, erect to suberect, glabrous peduncle 11-20 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 6 mm long; pedicel 11 mm long; ovary smooth, at most lightly pitted, 4 mm long; sepals bright rose, glabrous, the dorsal sepal transversely obovate-bilobed, 6 mm long, 11 mm wide expanded, connate to the lateral sepals for 3 mm to form a gaping cup, the apex retuse, acutely reflexed, abruptly contracted into a tail ca. 4 mm long, the lateral sepals oblong, oblique, 7 mm long, 3.5 mm wide, connate 2.5 mm to form an obtuse mentum below the column-foot, the apices oblique, acute, contracted into slender, purplish tails 15 mm long; petals translucent orange, oblong-ovate, 3.75 mm long, 1.25 mm wide, narrowed to the slightly dilated, rounded apex, the margins with acute angles below the middle; lip rose, the blade cuneate, 3.5 mm long, 3.75 mm wide, longitudinally callous toward the base, the apex purple-black, shortly pubescent, broadly rounded, the short apiculum sulcate, the base deflexed into a slender, straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 1.25 mm long, the slender foot 4 mm long, the stigma with a pair of pointed processes.

ECUADOR: Prov. of Carchi: epiphytic in cloud forest above Maldonado, alt. 1950 m, 3 Apr. 1984, *C. Luer, S. Dalström & T. Höijer 9913* (Holotype: MO).



This pretty species is obviously related to the similarly colored *P. amethystinum*, from farther south, but *P. hoeijeri* is distinguished by the much more broadly expanded, bilobed dorsal sepal with a longer tail. The margins of the petals are with acute toothlike processes above the base instead of toothless. The apex of the blade of the lip is broadly rounded instead of anchoriform, and the callus at the base is tall and rounded instead of low and nearly flat.

Porroglossum hoeijeri is found locally in one valley of northwestern Ecuador, where it was discovered most recently by Thomas Höijer. Previous collections of this species had been mistaken for *P. amethystinum*. Unfortunately, it is not in cultivation at this time.

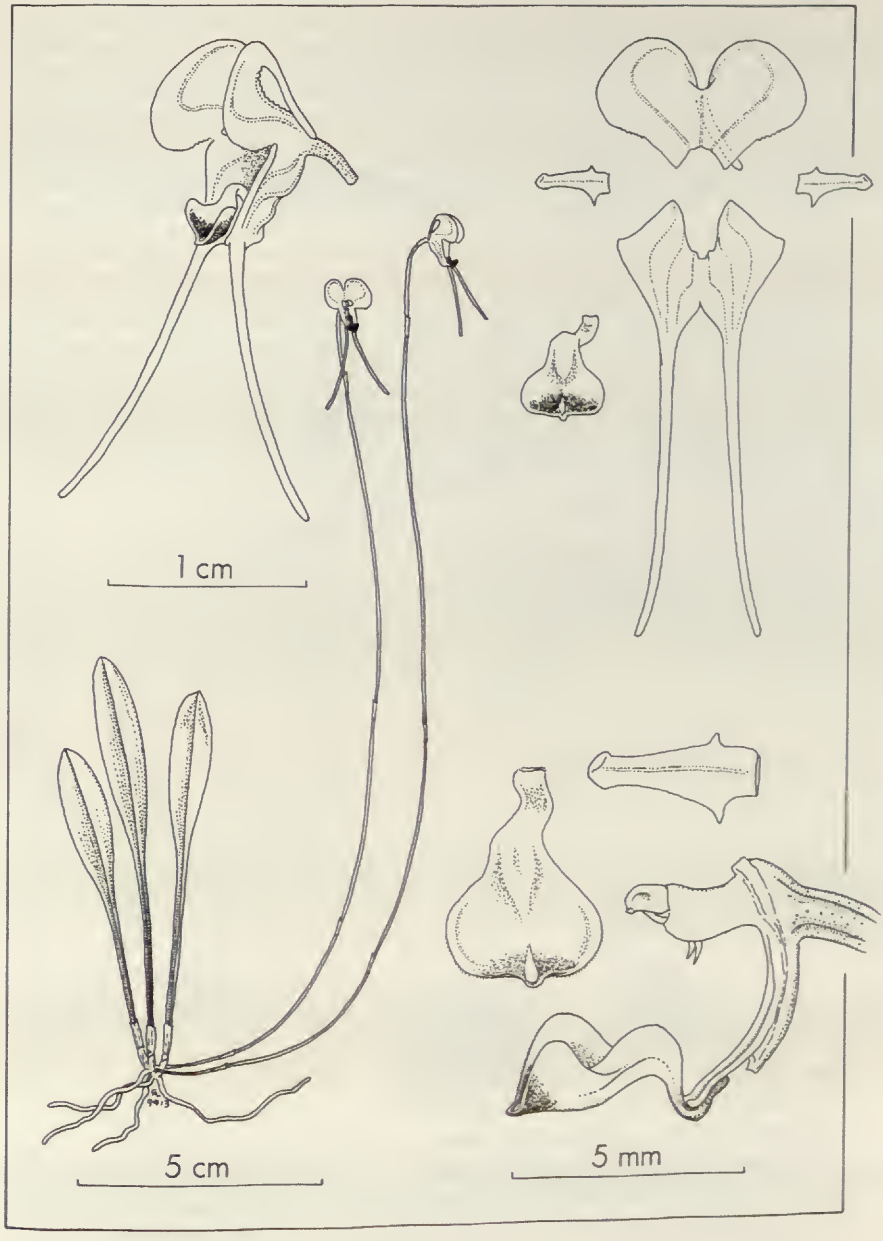


Plate 10. *Porroglossum hoeijeri* Luer

Porroglossum lycinum Luer, Phytologia 46: 377, 1980.

Ety.: From the Greek *lykinos*, "wolflike," in allusion to the appearance of the flower.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 10-15 mm long, enclosed by 2-3 loose, white, tubular sheaths. Leaf erect, coriaceous, subverrucose, lightly reticulate, long-petiolate, 3.5-5 cm long including the petiole 1-2.5 cm long, the blade obovate to elliptical, obtuse, 9-12 mm wide, the base cuneate into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by a suberect to horizontal, slender, glabrous peduncle 8-10.5 long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 6 mm long; ovary lightly subverrucose, 4 mm long; sepals yellow, suffused with brown apically, yellowish white basally, tricostate externally, dotted with purple and minutely red-spiculate within, the dorsal sepal subverrucose externally, narrowly ovate, concave below the middle, the apex narrowly obtuse, 15 mm long, 6 mm wide expanded, connate to the lateral sepals for 3 mm to form a cup, the lateral sepals transversely ovate, oblique, acute, 15 mm long, 6 mm wide at the base, connate 2.5 mm to each other and the column-foot to form a deep, obtuse mentum, the apices oblique, contracted into laterally and forwardly directed, thick, gradually narrowing apices or "tails," 3-veined; petals translucent light amber with a brown midvein, more or less oblong-ovate, 5 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins obtusely angled below the middle; lip pale green, the blade cuneate-obtriangular, heavily flecked with dark purple, spiculate, 5 mm long, 3.5 mm wide, the apex truncate, ciliate-pubescent, with a short, sulcate apiculum, gradually thickened and glabrous toward the base before becoming deflexed into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 2 mm long, the slender, curved foot 4 mm long.

PERU: Dept. of Amazonas: epiphytic in cloud forest between Pomacochas and Moyabamba, alt. 2100 m, Aug. 1979, W. Königer 29, flowered in cultivation in München, 19 May 1980, *C. Luer 5251* (Holotype: SEL).

This species is known only from the type collection, but several plants are in cultivation in Munich Germany. It was collected in 1979 by Willibald Königer and company during one of their searches for new species of *Masdevallia* in northern Peru. It first flowered in cultivation the following year.

Porroglossum lycinum is recognized by the small, spathulate, lightly reticulated, subverrucose leaves and a proportionately large yellow flower with broad, gradually narrowing, brown, forwardly directed apices. The callus of the blade of the lip is low and glabrous while the truncate apex of the blade spiculate-pubescent.

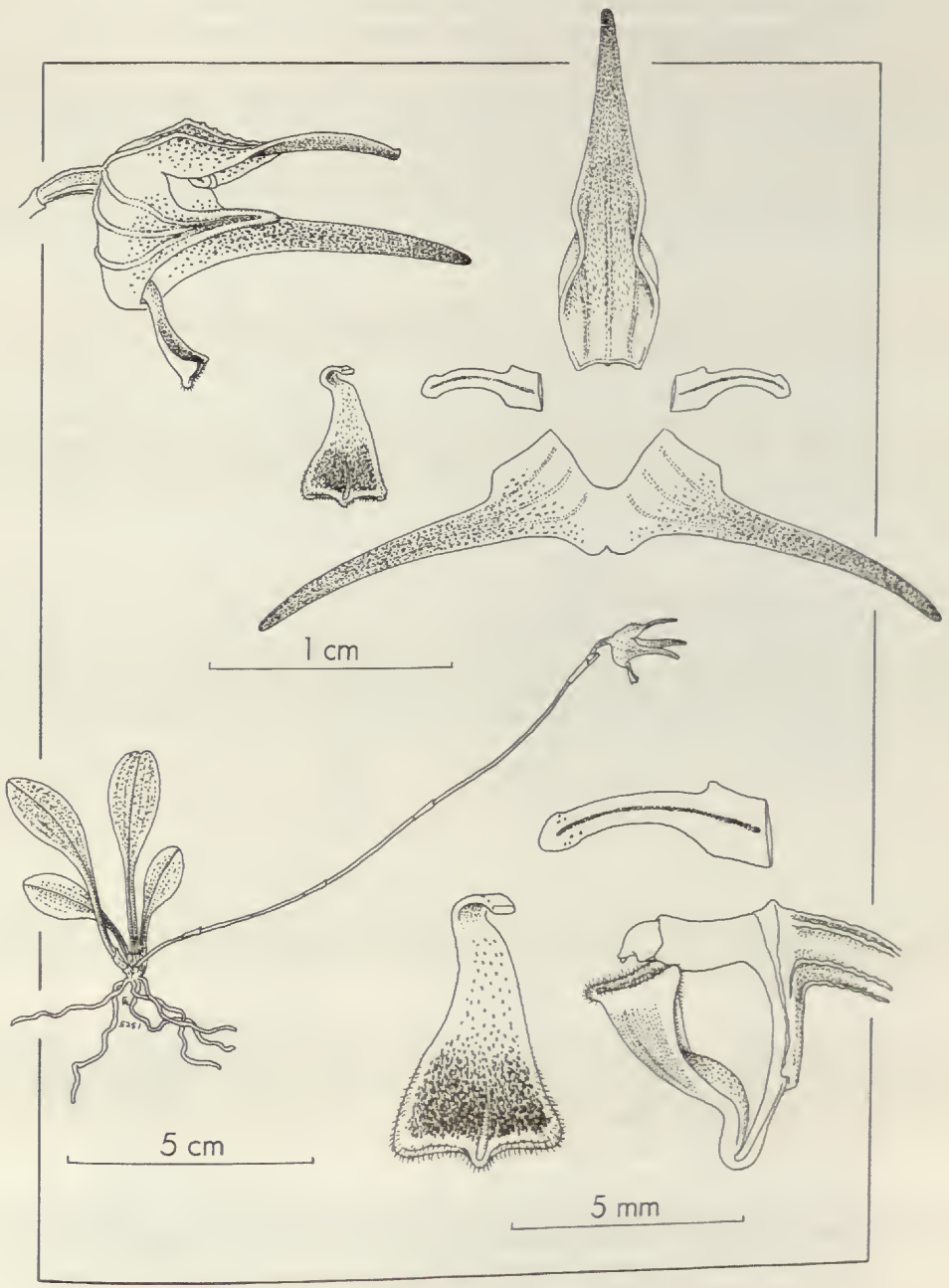


Plate 11. *Porroglossum lycinum* Luer

Porroglossum meridionale P. Ortiz, Orquideología 11: 224, 1976.

Ety.: From the Latin *meridionalis*, "southern," referring to the locality, the southernmost known for the genus at that time.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 0.5-1 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, verrucose, mottled with purple beneath, long-petiolate, 3-4.5 cm long including the petiole 1-1.5 cm long. the blade elliptical, obtuse to subacute, 8-10 mm wide, the base cuneate into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by a suberect, slender, glabrous peduncle 8-10 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 7 mm long; ovary verrugose, 4 mm long; sepals translucent light purple tricostate externally, dotted with purple and minutely red-spiculate within, the dorsal sepal subverrucose externally, ovate, subacute 7 mm long, 5 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex contracted into a terete, erect tail ca. 9 mm long, the lateral sepals transversely ovate, oblique, obtuse, 7 mm long, 6 mm wide at the base, connate 2.5 mm to each other and the column-foot to form a deep, obtuse mentum, the apices, contracted into terete, orange-brown tails ca. 8 mm long, petals translucent with a purple midvein, more or less oblong-ovate, 4 mm long, 1 mm wide, narrowed to the slightly dilated, rounded apex, the lower margin obtusely angled below the middle; lip purple, the blade cuneate-obtriangular, densely red-pubescent, 4 mm long, 3.5 mm wide, the apex truncate, ciliate-pubescent, with an obtuse, shallowly sulcate apiculum, gradually thickened toward the transverse, subpyramidal callus at the base before becoming deflexed into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the slender, curved foot 4 mm long.

PERU: Dept. of Huánuco: near Tingo Maria, alt. 1560 m, collected by F. Fuchs, Jr., Janet Kuhn et al., flowered in cultivation Dec. 1975 by M. & O. Robledo, at La Ceja, Colombia, *R. Escobar 1690* (Holotype: COL), flowered 15 Nov. 1977, *C. Luer 2200* (SEL); between Tingo Maria and Pucallpa, alt. 1700 m, collected by M. Arias, flowered in cultivation in München, Germany, Sept. 1982, *W. Königer s.n.* (SEL).

This species is apparently endemic in eastern central Peru where it was first collected by Janet Kuhn in a collecting party led by Fred Fuchs Jr. Plants were given to Rodrigo Escobar under whose watchful eye they have continued to survive in several collections. This species has also been discovered more recently in the same area by the Königers in their searches for the old and new species of *Masdevallia*.

Porroglossum meridionale is distinguished by the small, verrucose leaves, and comparatively large, dull purple flowers with terete, brownish tails. The callus of the lip is short, transverse and red-pubescent.

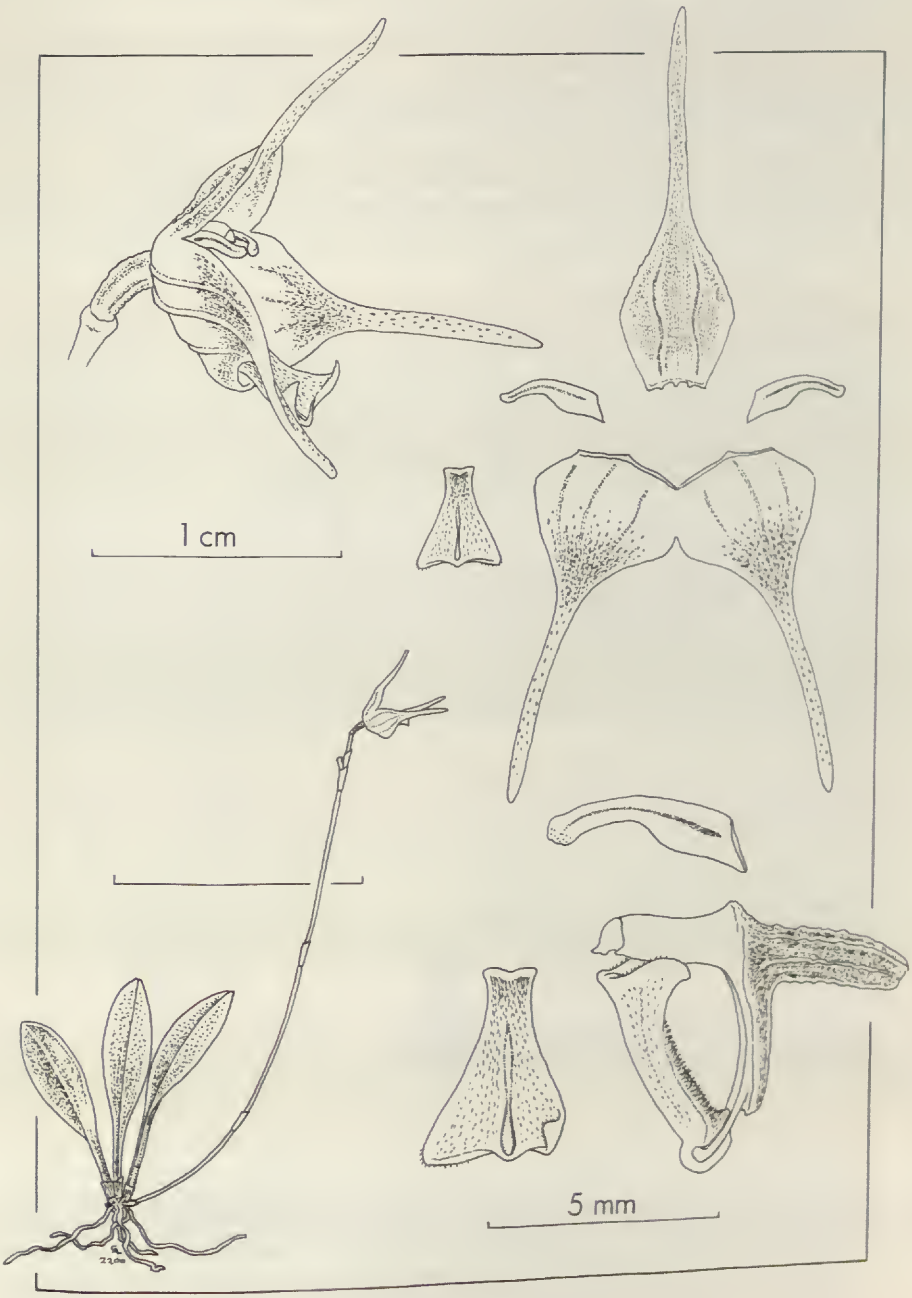


Plate 12. *Porroglossum meridionale* P. Ortiz

Porroglossum mordax (Rchb. f.) Sweet, Orquideología 5: 166, 1970.

Bas.: *Masdevallia mordax* Rchb. f., Flora 69: 599, 1886.
Ety.: From the Latin *mordax*, "biting," probably in allusion to the gaping, bilabiate flower with jagged margins of the sepals.

Syn.: *Porroglossum colombianum* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 83, 1920.
Ety.: Named for Colombia, the country of origin of the species.

Syn.: *Scaphosepalum antioquiense* Krzl., Notizbl. Bot. Gart. Berlin-Dahlem 8: 135, 1922.
Ety.: Named for the Department of Antioquia where the specimens were discovered.

Syn.: *Lothiania mordax* (Rchb. f.) Krzl., Gard. Chron. ser. 3, 75: 193, 1924.

Syn.: *Masdevallia colombiana* (Schltr.) P. H. Allen ex Hodge & Gutier, Rev. Fac. Nal. Agronom. Medellín, Col. 8:421, 1948.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 1-2 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, subverrucose, long-petiolate, 5-8 cm long including the petiole 1.5-3 cm long, the blade narrowly obovate to narrowly elliptical, subacute, 10-13 mm wide, gradually narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by a slender, erect, glabrous peduncle 10-15 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 4-5 mm long; pedicel 3-4 mm long; ovary subverrucose, 5-7 mm long; sepals light green, suffused with purple at the apices, subverrucose, tricostate externally, with thickened, coarsely erose margins, the dorsal sepal ovate, concave below the middle, 18-20 mm long, 7-8 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex narrowly obtuse, tailless, the lateral sepals narrowly ovate, oblique, 15-18 mm long, 4 mm wide, connate 2 mm to form a shallow mentum below the column-foot, the apices oblique, gradually contracted into broad, narrowly obtuse apices; petals translucent with a brown midvein, ovate, 5 mm long, 1.5 mm wide, narrowed to the rounded apex, the lower margin dilated below the middle; lip light green, the blade cuneate-obtriangular, 5 mm long, 4.5 mm wide, the apex transversely obtuse, shortly ciliate, shortly acuminate with a shallow, midline sulcus, gradually thickened below the apex into a low, dark purple, longitudinal, glabrous callus, deflexed below into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the slender foot 5 mm long.

COLOMBIA: Dept. of Cauca: western slopes of Munchique near Popayán, alt. 2300 m, *F. C. Lehmann 3620* (Holotype: G) (Lehmann's painting 350 at K bears no herbarium number, but a copy of the painting at W bears the number 3626); Dept. of Antioquia: without locality, alt. 2400 m, *Madero s.n.* (type of *P. colombianum*, presumably destroyed at B); Munic. of La Unión, San Bartolo, alt. 2400 m, collected by O. Robledo et al., 1976, flowered in cultivation at La Ceja, 23 July 1978, *C. Luer 2960* (SEL); La Primavera, 40 Km south of Medellín, alt. 1700 m, 12 June 1965, *C. Dodson & H. Hills 3105* (MO, SEL).

This unusual species was first collected on the western slopes of the western cordillera of Colombia, and beautifully illustrated by the German mining engineer and consul at Popayán, F. C. Lehmann, and described in 1886 by Reichenbach. It was also collected farther north in the department of Antioquia by Madero, and described by Schlechter as the basis for the genus *Porroglossum* in 1920. Kränzlin based his genus *Lothiania* on Lehmann's earlier collection, and reduced the synonym *P. colombianum* to *M. xipheres*. Kränzlin described a collection by Kalbreyer, unfortunately presumably destroyed at Berlin, in *Scaphosepalum* (*S. antioquiense*) which beyond doubt is this species.

Masdevallia mordax occurs locally in the western and central cordilleras of Colombia. It is easily recognized by the thickened margins of the narrowly triangular, tailless sepals that are are coarsely erose.

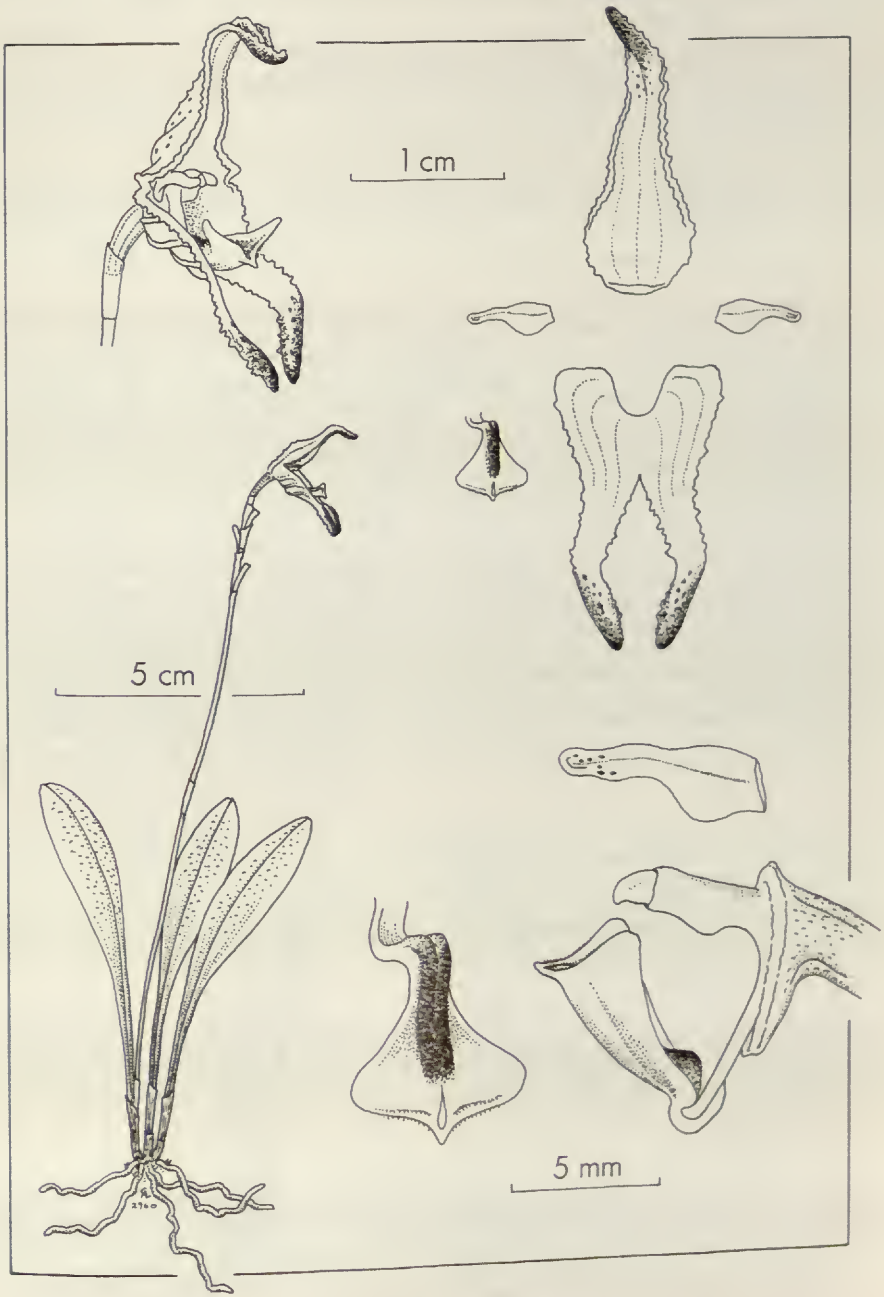


Plate 13. *Porroglossum mordax* (Rchb. f.) Sweet

Porroglossum muscosum (Rchb. f.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 83, 1920.

Bas.: *Masdevallia muscosa* Rchb. f., Gard. Chron. 1: 460, 1875.
Ety.: From the Latin *muscosus*, "mossy," referring to the pubescent peduncle.

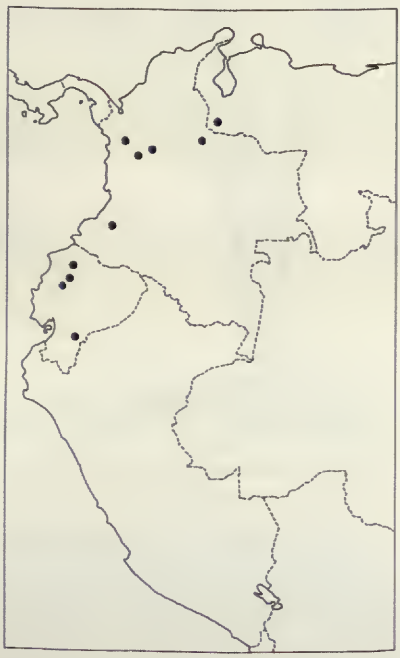
Syn.: *Masdevallia xipheres* Rchb. f., Linnaea 41: 12, 1876.
Ety.: From the Greek *xiphos*, "a sword," referring to the shape of the leaves.

Syn.: *Scaphosepalum xipheres* (Rchb. f.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 220, 1920.

Syn.: *Porroglossum xipheres* (Rchb. f.) Garay, Bot. Mus. Leafl. 21: 252, 1967.

Plant medium in size, epiphytic to terrestrial, shortly repent to caespitose; roots coarse, Ramicauls erect, slender, 1-4 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, verrucose, more or less suffused with purple, indistinctly to distinctly petiolate, 4-15 cm long including the petiole 1-4 cm long, the blade narrowly elliptical or narrowly obovate and acute, to elliptical and obtuse, 1-1.8 cm wide, gradually to abruptly narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, densely pubescent peduncle 8-26 cm long, with a bract near the middle, from low on the ramicaul; floral bracts tubular, imbricating, 5-7 mm long; pedicel 5-9 mm long; ovary verrucose, papillose, or long-hispid, 5-6 mm long; sepals green or light tan to brown, with the veins suffused with darker brown, glabrous to lightly verrucose externally, the dorsal sepal obovate, 7-8 mm long, 5-6 mm wide, connate to the lateral sepals for 3-5 mm to form a gaping cup, the apex subacute to obtuse, contracted into a slender, erect to reflexed tail 10-30 mm long, the lateral sepals ovate, oblique, 6-10 mm long, 5-6 mm wide, connate to each other for 2-3 mm to form a deep, obtuse mentum beneath the column-foot, the apices oblique, obtuse to acute, abruptly to gradually contracted into slender tails 10-30 mm long; petals translucent yellow-white to tan, with a purple or brown midvein, oblong-ovate, 4.5-5 mm long, 1-1.5 mm wide, slightly narrowed to the rounded apex, the margins without an angle; lip white, suffused with rose or purple, the blade cuneate to obovate-spathulate, 4-5.5 mm long, 3.5-4 mm wide, the obtuse apex ciliate, with a shallow sulcus, the disc with a low, longitudinal callus above the straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the stout foot 4-6 mm long.

COLOMBIA: Dept. of Antioquia: Frontino, Medellín, 1875, *Shuttleworth s.n.* (Holotype: W; K); without locality, *G. Wallis s.n.* (W); without locality, presented to K by Messrs. Hugh Low & Co., flowered in cultivation, 1887 (K); without locality, *B. Roezl s.n.* (W, holotype of *M. xipheres*); Río Piedras and La Ceja, alt. 2000-2400 m, 20 Sept. 1886, *F. C. Lehmann 3198* (G): Munic. of Frontino, alt. 1600 m, collected by R. Escobar et al., flowered in cultivation by M. & O. Robledo at La Ceja, 22 Oct. 1979, *C. Luer 4304* (SEL); Munic. of Cocorná, Quebrada Guarindo, alt. 1800 m, R. Escobar et al., flowered in cultivation by M. & O. Robledo, 21 July 1978, *C. Luer 2941* (SEL); Dept. of Cauca: Munchique, alt. 2000-2300 m, 3 May 1883, *F. C. Lehmann 2810* (G); Dept. of Norte de Santander: epiphytic in cloud forest, Alto de Santa Inéz, alt. 2050 m, 23 May 1982, flowered in cultivation at Colombborquídeas 16 Apr. 1983, *C. Luer, R. Escobar & D. Portillo 8714* (SEL); Intend. of Putumayo: between La Cocha and Sibundoy, alt. 2700 m, collected by O. Ospina, flowered in cultivation in Sibundoy, 5 Aug. 1978, *C. Luer 3094* (SEL).
ECUADOR: Prov. of Imbabura: terrestrial on the



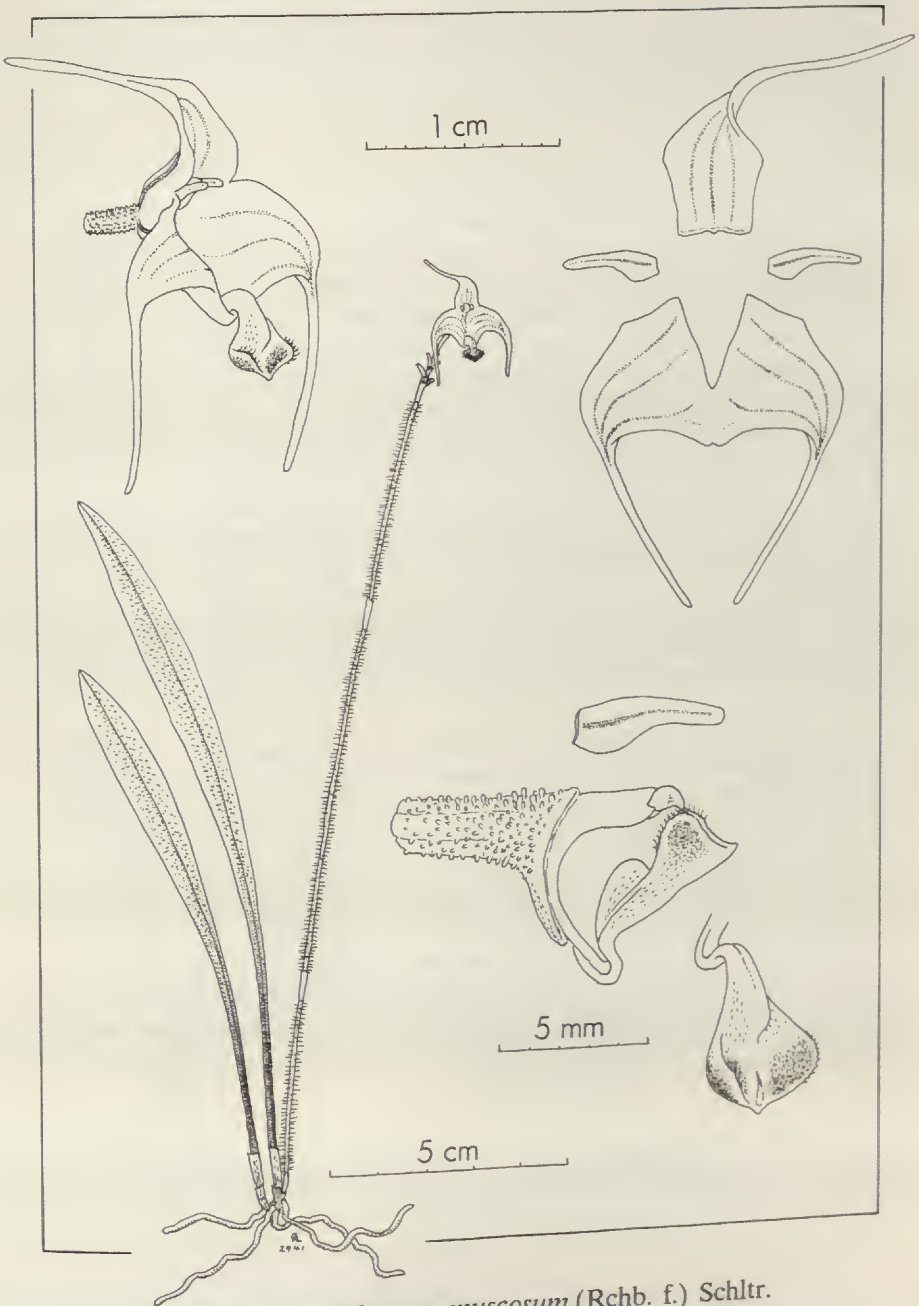


Plate 14. *Porroglossum muscosum* (Rchb. f.) Schltr.

roadcut between Otovalo and Apuela, alt. 2000 m, 8 Feb. 1979, *C. Luer, J. Luer, A. Hirtz & R. Escobar 3938* (SEL); Prov. of Morona-Santiago: collected by W. Teague near Limón, alt. 1000 m, 1972, flowered in cultivation 12 Dec. 1978, *C. Luer 3630* (MO); Prov. of Pichincha: western slopes of Corazón, Río Silante, alt. 2000 m, 14 Jan. 1881, *F. C. Lehmann 315* (G); epiphytic in cloud forest above Tandapi, alt. 2000 m, 31 Mar. 1984, *C. Luer, S. Dalström, T. Höijer, J. Kuijt & A. Hirtz 9823* (MO).
VENEZUELA: State of Táchira: headwaters of Río Quinimari, alt. 2500 m, *G. C. K. Dunsterville 1143*

This species is rather frequent, widespread and variable in its wide range through the Andes from Venezuela through Ecuador, at altitudes below 2500 meters above sea level. It was the first species of the genus to be brought into cultivation in Europe. Specimens cultivated at Kew were the first in which the sensitive labellum was observed and reported by W. Bean in 1887.

Porroglossum echidna, from higher altitudes in the eastern cordillera of Colombia, is little more than a local race of *P. muscosum*. Reichenbach's type specimen of *M. echidna* collected by Wagener demonstrates the characteristic clavate, sepaline tails abruptly produced from obtuse apices. Typically the tails of *P. muscosum* are slender, but clavate or non-clavate tails are permitted in other species of the Pleurothallidinae (e.g. *Masdevallia zahlbruckneri* Krzl.). Abruptly to gradually produced tails are seen in various clones of *P. muscosum*.

The leaves of *P. muscosum* are variable from narrowly elliptical (Plate 14.) to broadly elliptical and long-petiolate (Plate 15.). The texture varies from relatively thin to thickly coriaceous and verrucose, sometimes dark bluish green in color.

Verrucose sepals are also characteristic of *P. echidna*, but occasionally the sepals of some clones of *P. muscosum* are lightly verrucose. (Plate. 16.). A specimen with elongated, narrowly acute apices of the lateral sepals gradually attenuated into long, slender tails was described by Reichenbach as *Masdevallia xipheres* (Plate 17.).

The callous thickenings of the forward portion of the blades of the lips of both concepts are too similar to be of diagnostic value. The longitudinal callus of the blade of the lip is not constant in height or shape. The length of the hairs on the peduncle varies in both concepts, rendering this feature to be of no diagnostic value. The ovaries of *P. echidna* are long-hispid, but the ovaries of some clones of *P. muscosum* are also long-hispid, although most have ovaries verrucose or papillose.

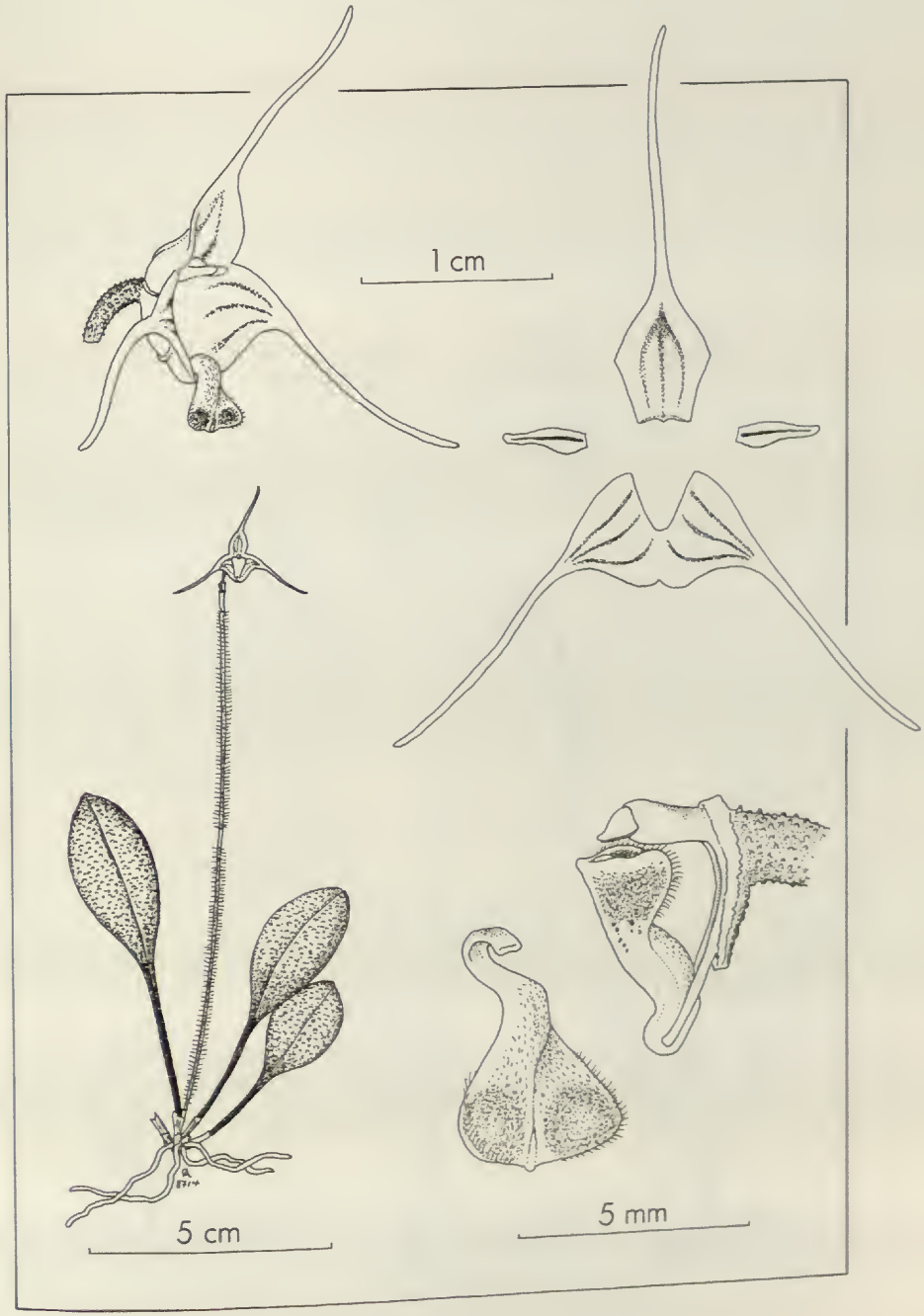


Plate 15. *Porroglossum muscosum* (Rchb. f.) Schltr.

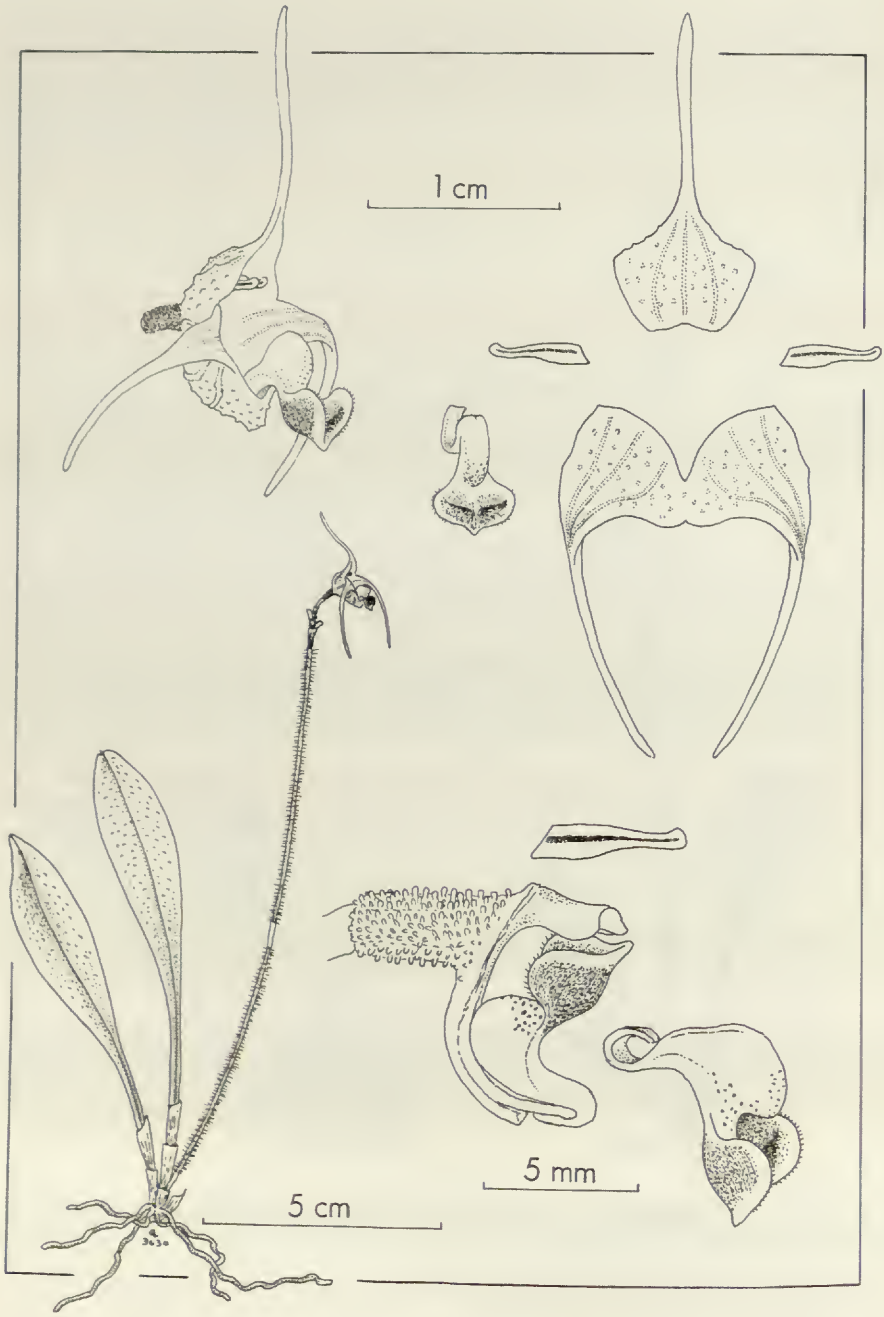


Plate 16. *Porroglossum muscosum* (Rchb. f.) Schltr.

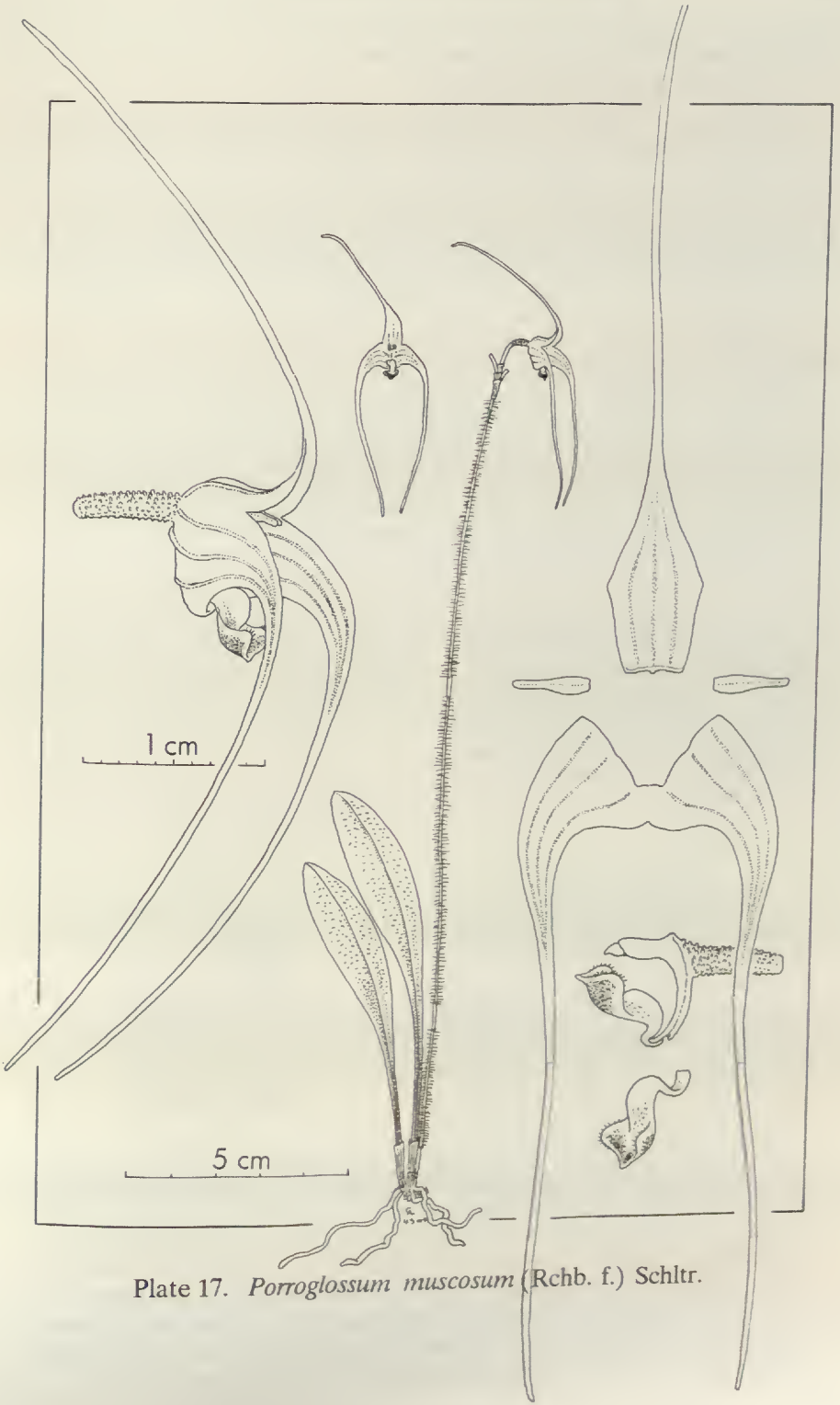


Plate 17. *Porroglossum muscosum* (Rchb. f.) Schltr.

Porroglossum nutibara Luer & Escobar, sp. nov.

Ety.: Named for the local Indian chief Nutibara.

Species haec *P. sergioi* P. Ortiz similis, sed sepalis niveis, cauda sepali dorsalis subnulla et caudis sepalorum lateralium clavatis differt.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 1-1.5 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, petiolate, 3-9 cm long including the petiole 1-4 cm long, the blade narrowly obovate, subacute, 9-11 mm wide, gradually narrowed below into the slender petiole. Inflorescence a congested, successively few-flowered raceme, borne by a slender, erect, glabrous peduncle 15-20 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 4-5 mm long; pedicel 5-6 mm long; ovary smooth, 5 mm long; sepals white with light yellow veins, sparsely red-pubescent within, the dorsal sepal transversely obovate-bilobed, 5 mm long, 10 mm wide expanded, connate to the lateral sepals for 3 mm to form a gaping cup, the apex retuse, acutely reflexed, abruptly short-apiculate, the lateral sepals oblong, oblique, 8 mm long, 5 mm wide, connate 4 mm to form an obtuse mentum below the column-foot, the apices oblique, obtuse, contracted into descending, thickened, subclavate, yellow tails 10 mm long; petals translucent white, oblong-ovate, 4 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins with obtuse angles below the middle; lip white, the blade obovate, 5 mm long, 5 mm wide, dark red and minutely red-pubescent above the middle, the apex broadly rounded to obtuse, with a short, obtuse, narrowly sulcate apiculum, the base with a tall, rounded, longitudinal, glabrous, callus, deflexed below into a slender, straplike claw bent with tension about the free apex of the column-foot; column semiterete, 2 mm long, the slender foot 6 mm long.

COLOMBIA: Dept. of Antioquia: Munic. of Frontino, Alto de Cuevas, alt. 2050 m, collected 3 May 1983 by R. Escobar et al., flowered in cultivation at Colomborquídeas, April 1985, *R. Escobar s.n.* (Holotype: JAUM; Isotype: MO); same area, collected March 1974, *R. Escobar, S. Restrepo, et al., 1204* (JAUM), flowered in cultivation by M. & O. Robledo at La Ceja , *C. Luer 2107* (SEL).

In the original publication of *P. sergioi* by Father Ortiz a photograph of a sympatric, deceptively similar, but as yet still another undescribed species, was used as an illustration. Consequently, the species shown in the photograph became known as *P. sergioi*. It was not until a few years later that the two species were recollected, and the error realized. The species in flower in the photograph on the cover of Orquideología Vol. 10, No. 3, is described here as *P. nutibara*. Both *P. nutibara* and *P. sergioi* are apparently endemic in the mountains above Nutibara in the Western Cordillera in the department of Antioquia, Colombia. Both were first collected by Father Sergio Restrepo, Rodrigo Escobar, Martha de Robledo and others during an Easter vacation.

This white-flowered species is distinguished by the broad, retuse, apiculate dorsal sepal; the long, thickened, subclavate tails of the lateral sepals shortly pubescent within; and the tall, rounded carina of the lip.

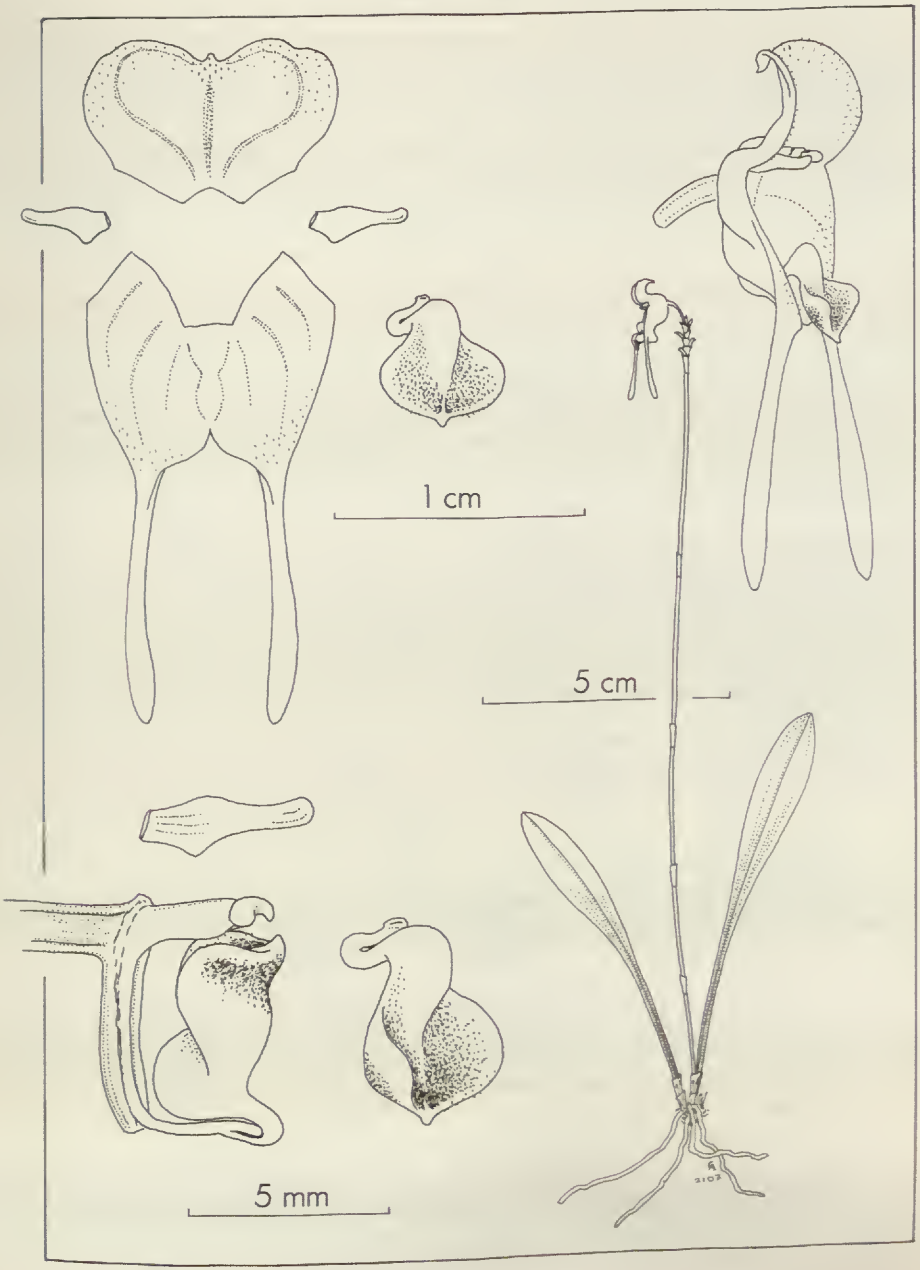


Plate 18. *Porroglossum nutibara* Luer & Escobar

Porroglossum olivaceum Sweet, Orquideología 5: 167, 1970.

Ety.: From the Latin *olivaceus*, "olive-colored," referring to the color of the flowers.

Plant medium in size, epiphytic to terrestrial, caespitose; roots slender. Ramicauls erect, slender, 0.5-1.5 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, lightly to distinctly verrucose, long-petiolate, 5-10 cm long including the petiole 1-4 cm long, the blade narrowly elliptical, acute, 0.8-1.5 cm wide, narrowly cuneate below into the slender petiole. Inflorescence a congested, successively several-flowered raceme up to 2 cm long, borne by an erect, slender peduncle 10-25 cm long, with 2-3 bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5-8 mm long; pedicel 5-15 mm long; ovary lightly subverrucose, 3-5 mm long; sepals light tan to light yellow-brown, with the veins darker, glabrous, the dorsal sepal obovate, 4-5 mm long, 6 mm wide, connate to the lateral sepals for 2.5-3.5 mm to form a gaping cup, the anterior free margin obtusely angled, the apex obtuse, acutely reflexed into a slender tail 2-3 mm long, the lateral sepals transversely oblong, oblique, 3-3.5 mm long, 4-7 mm wide, connate to each other for 2-5 mm to form a deep, acute mentum between the column-foot and the junction of the two lateral sepals, the apices broadly obtuse, abruptly contracted into slender tails 9-13 mm long; petals translucent light yellow or light brown, with a darker midvein, oblong-ovate, 3.5-5 mm long, 1-2 mm wide, slightly narrowed to the rounded, clavate apex, the lower margins with an acute angle near the middle; lip yellow, the blade cuneate, dark purple and densely short-pubescent on the distal half, 4-5 mm long, 3-3.5 mm wide, the obtuse apex minutely ciliate, with a shallow sulcus, the disc with a tall, rounded, longitudinal callus above the straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete 2 mm long, the foot 4-5 mm long.

ECUADOR: Prov. of Imbabura: forest above García Moreno, alt. 5000 ft., 8 Sept. 1944, *W. B. Drew E-536* (Holotype: AMES); Prov. of Pichincha: epiphytic in cloud forest, Río Silante, west slope of Pichincha, alt. 2000 m, 29 Oct. 1979, *C. Luer, J. Luer & A. Hirtz 4397* (SEL); above Tandapi, alt. 2000 m, May 1985, *A. Hirtz 2567* (MO).
COLOMBIA: Dept. of Nariño: epiphytic in cloud forest above Ricaurte, alt. 1600 m, 5 Nov. 1979, *C. Luer, J. Luer & A. Hirtz 4616* (SEL).

This species is frequent and locally abundant in northwestern Ecuador and neighboring southwestern Colombia. It was first collected W. B. Drew. Masses of dozens of plants sometimes colonize the clay embankments of roadcuts through cloud forests, in addition to its usual habitat in the mossy trees. It is variable in size of the flowers and in the intensity and hue of the tan color of the sepals.

Porroglossum olivaceum is closely related to *P. amethystinum* which grows within its range. *Porroglossum olivaceum* is distinguished by the light tan color of the flowers with darker veins, obtusely angled free margins of the dorsal sepal, and transverse apices of the lateral sepals. The tails of the lateral sepals usually emerge about equidistant between the points of junction with the dorsal sepal and the other lateral sepal where a deep, acute mentum is formed (Plate 19.). In some populations the tails emerge nearer the the mentum than the dorsal sepal (Plate 20.). Occasionally a non-resupinate flower is produced (Plate 21.). The blade of the lip has a tall, longitudinal callus.

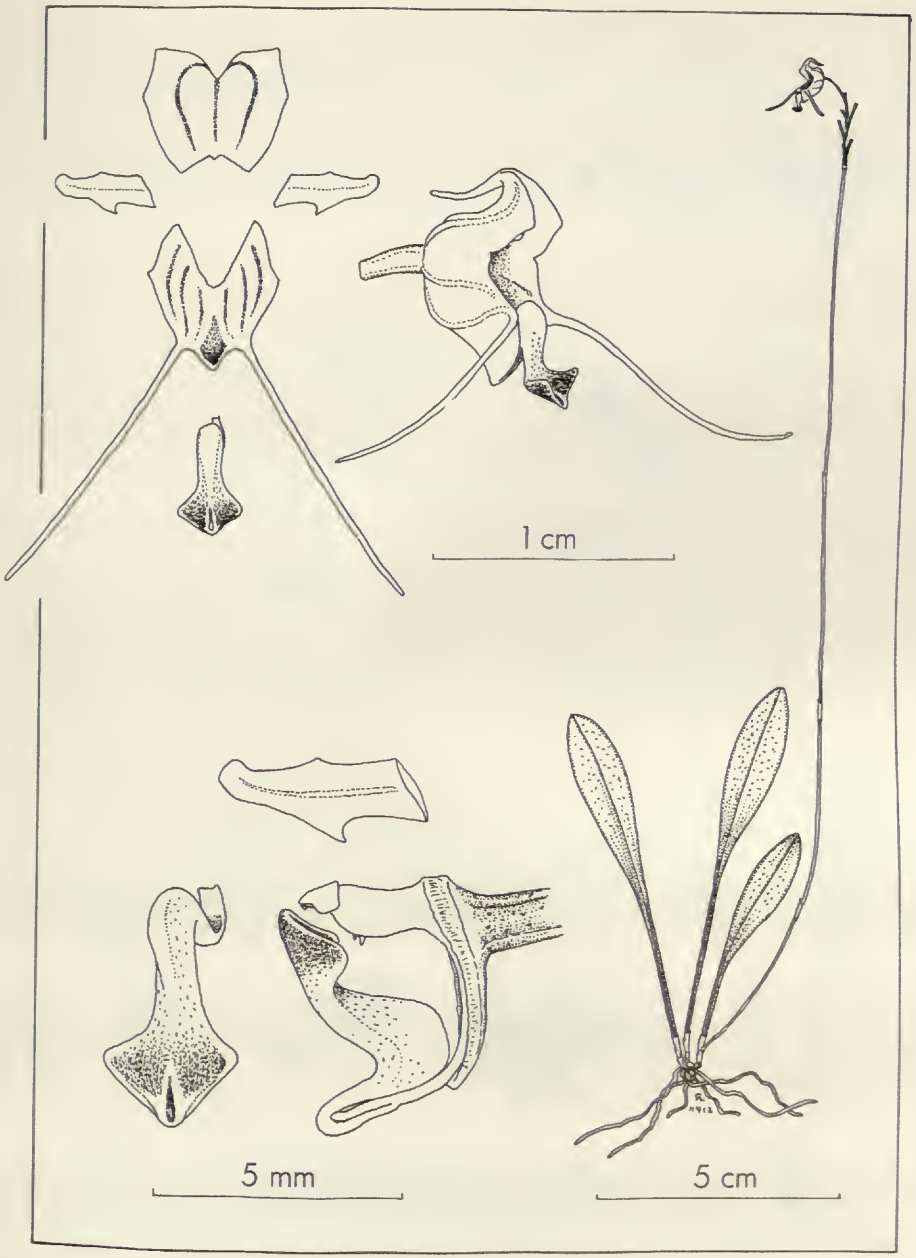


Plate 19. *Porroglossum olivaceum* Sweet

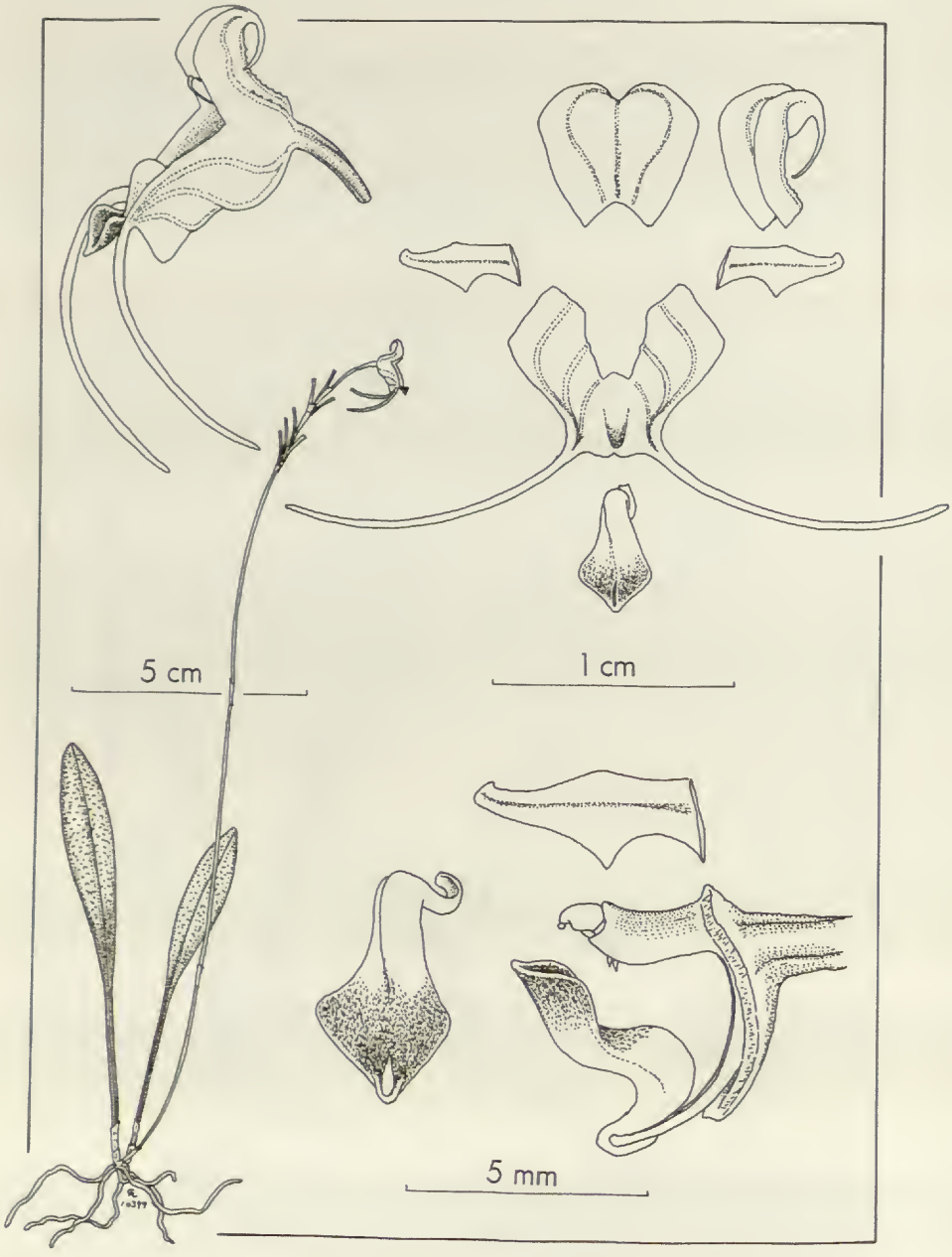


Plate 20. *Porroglossum olivaceum* Sweet

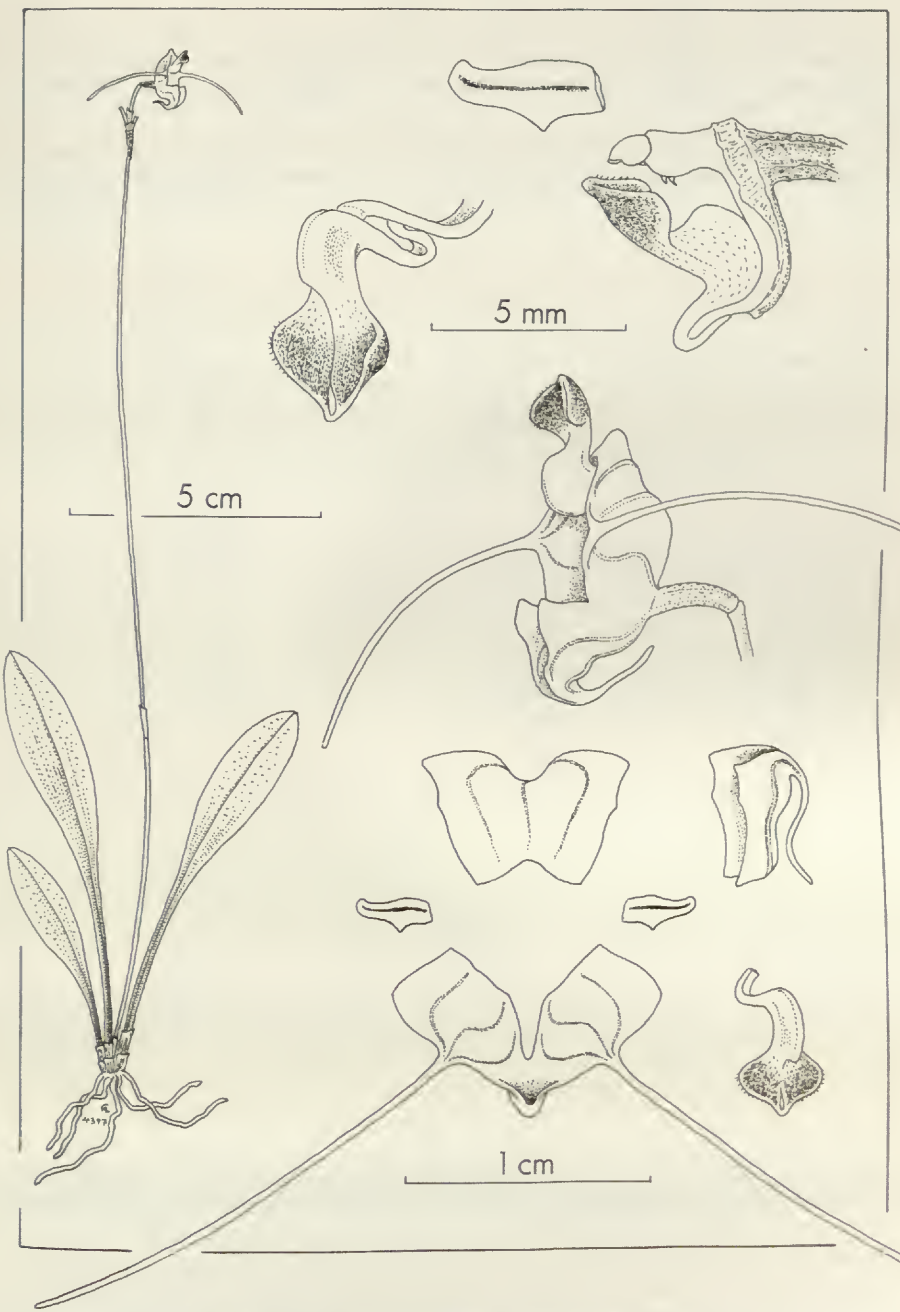


Plate 21. *Porroglossum olivaceum* Sweet

Porroglossum peruvianum Sweet, Amer. Orchid Soc. Bull. 42: 221, 1973.

Ety.: Named for Peru, the country of origin of the species.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 5-10 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, subverrucose, long-petiolate, 3-5.5 cm long including the petiole 1-2.5 cm long. the blade obovate to elliptical, obtuse, 8-12 mm wide, the base narrowly cuneate into the slender petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, slender, glabrous (but sometimes lightly scabrous) peduncle 9.5-13 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 6 mm long; ovary green with brown stripes, subverrucose, 5 mm long; sepals light yellow, with darker yellow veins, the broad tail-like apices suffused with brown and dotted with red-brown, tricostate externally, glabrous, the dorsal sepal ovate, 17 mm long, 4.5 mm wide, the apex narrowed into the broad, antrorse tail, connate to the lateral sepals for 3 mm to form a gaping cup, the lateral sepals ovate, oblique, 14 mm long, 6 mm wide, connate 2 mm to each other and 4 mm to the the column-foot to form a deep, obtuse mentum, the apices oblique, contracted into broad, descending, narrowly obtuse apices; petals translucent light yellow with a brown midvein, more or less oblong-ovate, 4.5 mm long, 1 mm wide, narrowed to the slightly dilated, rounded apex, the margins obscurely obtusely angled below the middle; lip bright yellow, the blade cuneate-obtriangular, microscopically pubescent, 5 mm long, 3.5 mm wide, the apex truncate, with an obtuse, sulcate apiculum, the base with a low, transverse, glabrous callus, deflexed below into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the slender foot 4.5 mm long.

PERU: Dept. of Amazonas: Prov. of Bongara, 350 km along the Olmos-Pomacochas-Jumbilla road, epiphytic in mossy trees, alt. 1500 m, 25 July - 2 Aug. 1965, *D. Bennett II & D. Bennett III 1959* (Holotype: AMES); same area, between Chachapoyas and Pomacochas, alt. 2000 m, Aug. 1978, collected by B. Würstle & W. Königer 4-a, flowered in München 19 May 1980, *C. Luer 5253* (SEL).

This species is apparently endemic in northern Peru where it was first discovered by David Bennett and his son, of Lima Peru. It was painted by Mario Pastorelli, artist and illustrator of the orchids of Peru. It also has been discovered by Würstle and Königer on one of their quests for *Masdevallia* in Peru. It is in cultivation in Germany.

Porroglossum peruvianum seems most similar to *P. meridionale* Ortiz, also also from Peru, but the former may be distinguished by the broader tails and the glabrous callus of the lip.

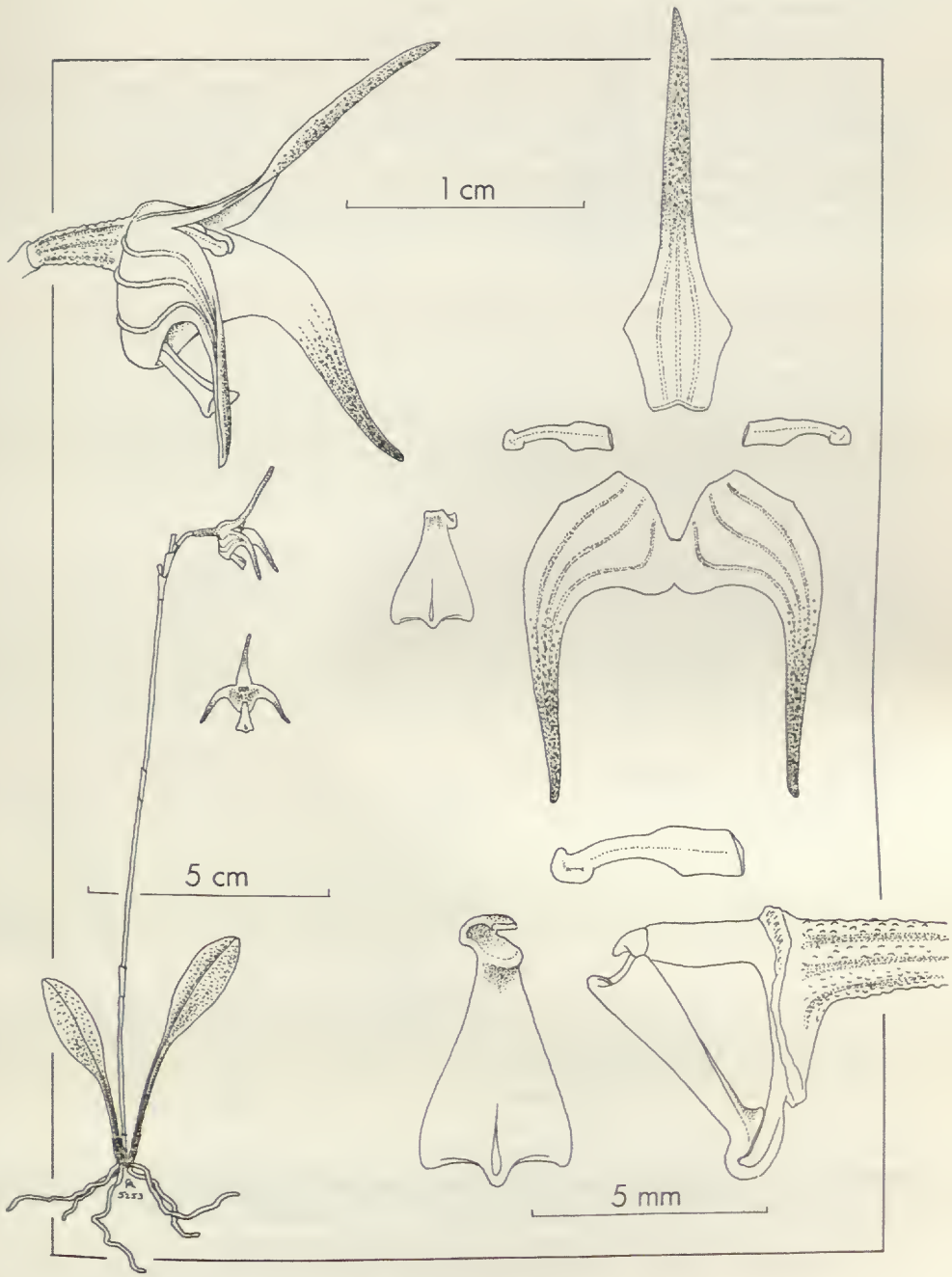


Plate 22. *Porroglossum peruvianum* Sweet

Porroglossum portillae Luer & Andreetta, Phytologia 47:81, 1980.

Ety.: Named in honor of Mario Portilla, co-discoverer of this species.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 10-15 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, long-petiolate, 4.5-6 cm long including the petiole 1-2 cm long, the blade reticulated, elliptical, obtuse, 12-15 mm wide, the base cuneate into the slender, blackish petiole. Inflorescence a congested, successively few-flowered raceme, the flowers non-resupinate, borne by an erect, smooth, slender peduncle 8-11 cm long, with 2-3 closely applied, distant bracts, from low on the ramicaul; floral bracts thin, imbricating, 4-5 mm long; pedicel 5-6 mm long; ovary twisted, 5 mm long; sepals yellow, suffused with rose, diffusely dotted with purple, glabrous, the middle sepal oblong, concave, 7 mm long, 6 mm wide, connate to the lateral sepals for 4 mm, the obtuse apex contracted into a 5 mm long, 1 mm thick, descending tail, the lateral sepals transversely oblong, 6 mm long, 8 mm wide, connate to each other for 3 mm behind the free apex of the column-foot, the broadly obtuse apices abruptly contracted into terete, obliquely descending tails 7 mm long; petals rose, ovate-oblong, 5 mm long, 1 mm wide, narrowed below the thickened, dilated apex, both margins with an acute process in the middle third; lip rose, flecked with purple, the blade obtriangular, shortly pubescent, the truncate apex ciliate, subtrilobed, 5 mm long, 4.5 mm wide, the lateral angles narrowly rounded, the apex obtusely triangular, the base with a low, inclined callus, deflexed below into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2.5 mm long, the foot 4 mm long, the stigma with a pair of pointed processes.

ECUADOR: Prov. of Morona-Santiago: epiphytic in wet forest near Río Calagrás, alt. 1500 m, April 1979, A. Andreetta & M. Portilla 3401, flowered in cultivation in Cuenca 29 Sept. 1980, *C. Luer 5447* (Holotype: SEL).

This species was first discovered by Padre Andreetta and his companion Mario Portilla in the rich rain forest along the Río Calagrás as the trees were being cut for the new road to Gualaquiza from the north. It flowered in Padre Andreetta's orchid collection the following year. It is apparently endemic in this one valley of southeastern Ecuador. Plants are still in cultivation.

Porroglossum portillae is characterized by the reticulated, long-petiolate leaves and an erect inflorescence of relatively large, non-resupinate ("doubly resupinate") flowers. The lip is borne uppermost by an ovary that is twisted through 360°. The flowers are yellowish, suffused with rose and the diffuse dotting with purple extends onto the thick tails of the sepals that are conspicuously deflexed.

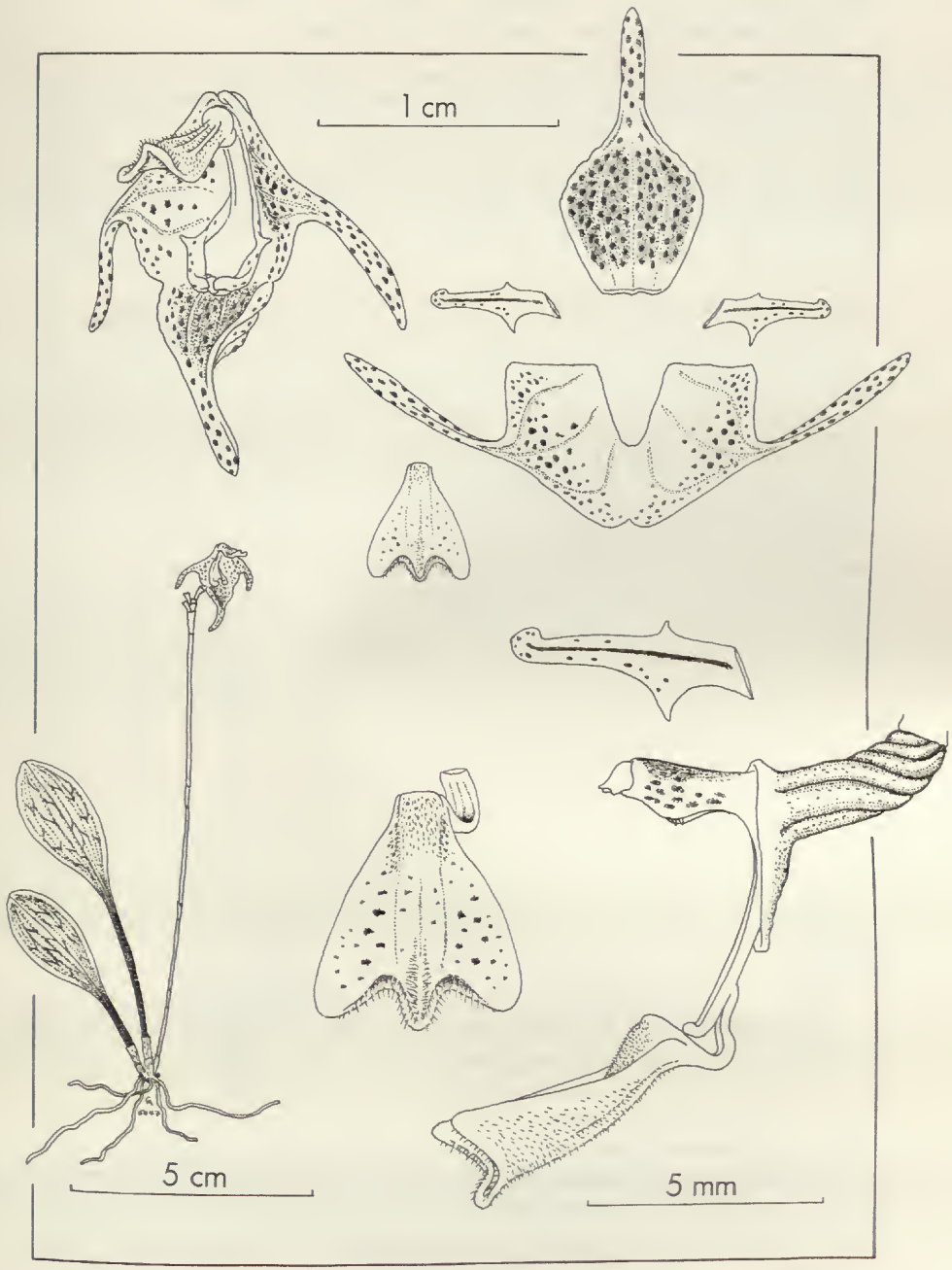


Plate 23. *Porroglossum portillae* Luer & Andreetta

Porroglossum procul Luer & Vásquez, Phytologia 46: 378, 1980.

Ety,: From the Latin *procul*, "far," referring to the distant locality.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 5-10 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, minutely verrucose, petiolate, 2-3.5 cm long including the petiole 0.7-1.5 cm long, the blade elliptical to narrowly obovate, subacute, 7-9 mm wide, gradually narrowed below into the blackish petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect, slender, glabrous peduncle 6.5-7.5 cm long, with a few, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 6 mm long; ovary black, rugose-verrucose, 4 mm long; dorsal sepal translucent pale rose-brown, speckled with light purple, glandular-cellular within, obovate, 5 mm long, 3.25 mm wide, connate to the lateral sepals for 3 mm into a laterally compressed cup, the apex obtuse, contracted into an erect, light tan, terete tail 6 mm long; lateral sepals translucent yellow-green with brown veins, transversely oblong, oblique, ca. 5 mm long, 7 mm wide at the base, 3 mm wide between the column-foot and the anterior margin, connate 3 mm to form with the column-foot a deep mentum, the apices obtuse, oblique, contracted into ascending, light tan, terete tails 7 mm long; petals translucent pale yellow, more or less oblong, 4 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins with a subacute angle above the middle; lip white, the blade cuneate-obtriangular, 4 mm long, 2 mm wide, cellular-glandular, the truncate apex with a shallowly sulcate apiculum, the base thickened into a low, obtuse callus, extended below into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the foot 3 mm long, the stigma with a pair of pointed processes.

BOLIVIA: Dept. of La Paz: Prov. of Nor Yungas, epiphytic in cloud forest southeast of Coroico, alt. 2000 m, 3 Feb. 1980, *C. Luer, J. Luer, R. Vásques & R. Lara 5071* (Holotype: SEL).

This species, the first and only species of the genus to be reported from Bolivia, is presently the species from the farthest south locality known in the genus. One flowering plant was discovered by Jane Luer in a dwarfed tree of a patch of elfin forest. On subsequent visits to this same area, several sterile plants, presumably of this species, have been found. It is not known to be in cultivation.

Porroglossum procul is closely allied to the Ecuadorian *P. andreettae* Luer, but it is distinguished by the lateral sepals that are abruptly contracted into slender, ascending, terete tails. The tails of *P. andreettae* are broader and descending. The petals, lips and columns of the two species are very similar, including the pair of pointed stigmatic processes.

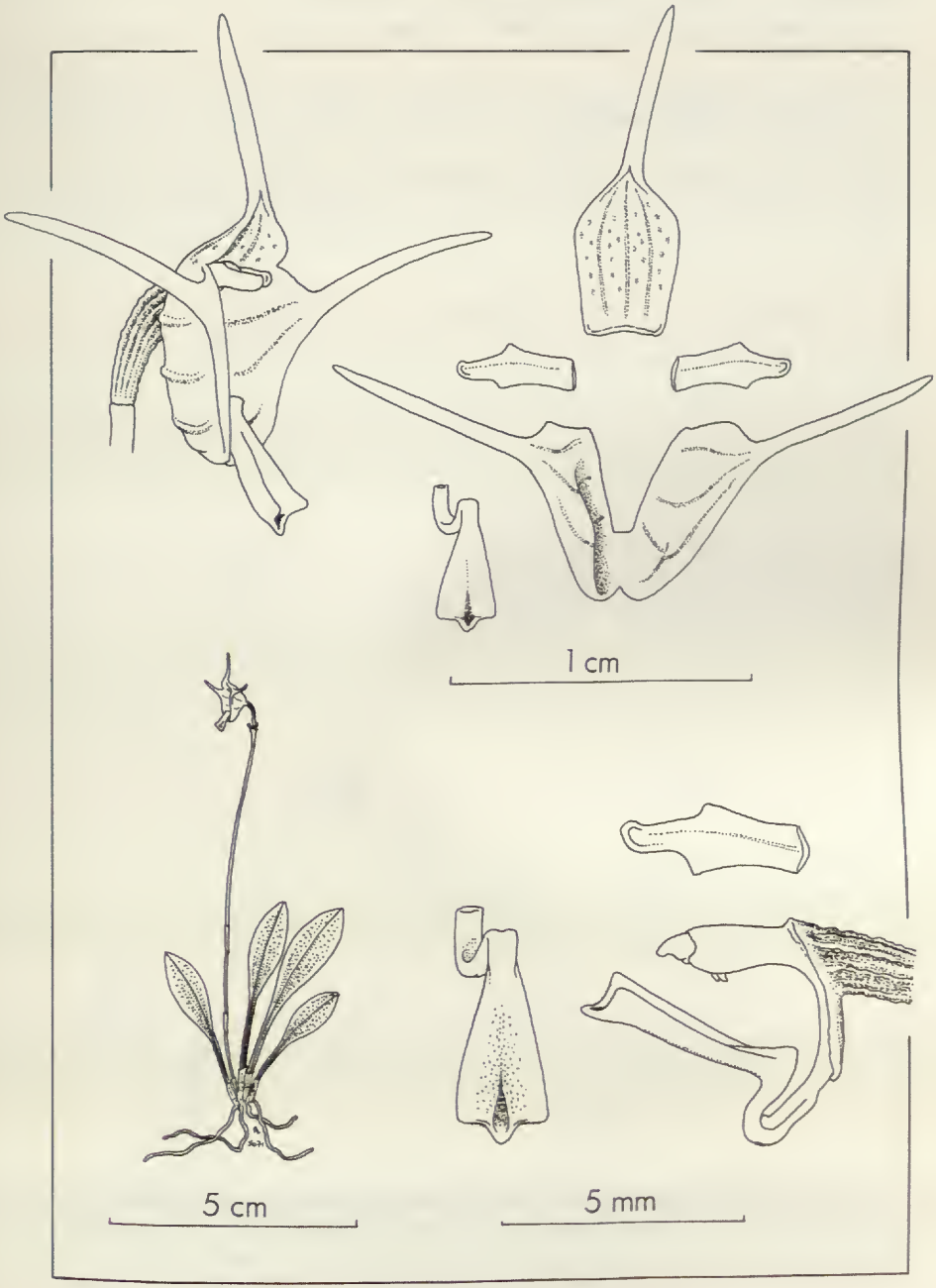


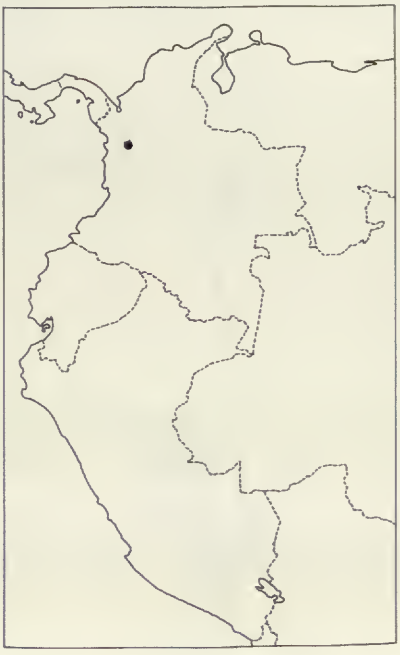
Plate 24. *Porroglossum procul* Luer & Vásquez

Porroglossum rodrigoi Sweet, Orquideología 9:129, 1974.

Ety.: Named in honor of Rodrigo Escobar R. of Medellín, Colombia, who discovered this species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, ca. 0.5 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, reticulated, 2.5-4.5 cm long including the petiole 1-1.5 cm long, the blade elliptical, obtuse to subacute, 0.9-1.2 cm wide, the base cuneate into the petiole. Inflorescence a congested, successively several-flowered raceme, borne by an erect, smooth, slender peduncle 6-7 cm long, with 2 closely applied, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 3-5 mm long; pedicel 3-5 mm long; ovary 3.5 mm long; sepals purple, glabrous, the dorsal sepal transversely ovate, concave, 4.5 mm long, 6 mm wide expanded, connate to the lateral sepals for 2 mm, the obtuse apex conduplicate, contracted into a slender, recurved, 1.5 mm long tail, the lateral sepals ovate, oblique, 4 mm long, 5 mm wide, connate to each other for 2 mm to form a broad mentum, the obtuse apices contracted into light yellow, thick, clavate tails 5 mm long; petals translucent red-purple, ovate-oblong, 3.25 mm long, 1.5 mm wide, narrowed below the rounded apex, both margins obtusely angled below the middle; lip white, suffused with rose, the blade anchoriform-cuneate, 3 mm long, 2.5 mm wide, the lateral angles obtuse, retrorse, the apex obtuse with a short, obtuse, sulcate apiculum, the blade toward the base with a low, longitudinal thickening, deflexed below into a straplike claw bent with tension around the free apex of the column-foot; column red-purple, stout, semiterete, 2 mm long, the foot 3 mm long.

COLOMBIA: Dept. of Antioquia: Munic. of Yarumal, La Bodega, Briceño, alt. 1700 m, *R. Escobar 1055* (Holotype: AMES), flowered in cultivation by M. & O. Robledo at La Ceja, 9 Oct. 1977, *C. Luer 1958* (SEL).



This small-flowered species is known from only one area north of the city of Medellín in the Central Cordillera of Colombia where it was discovered by Rodrigo Escobar. It is distinguished by the little purple flowers with a very short, thin tail of the dorsal sepal and prominently clavate yellowish tails of the lateral sepals.

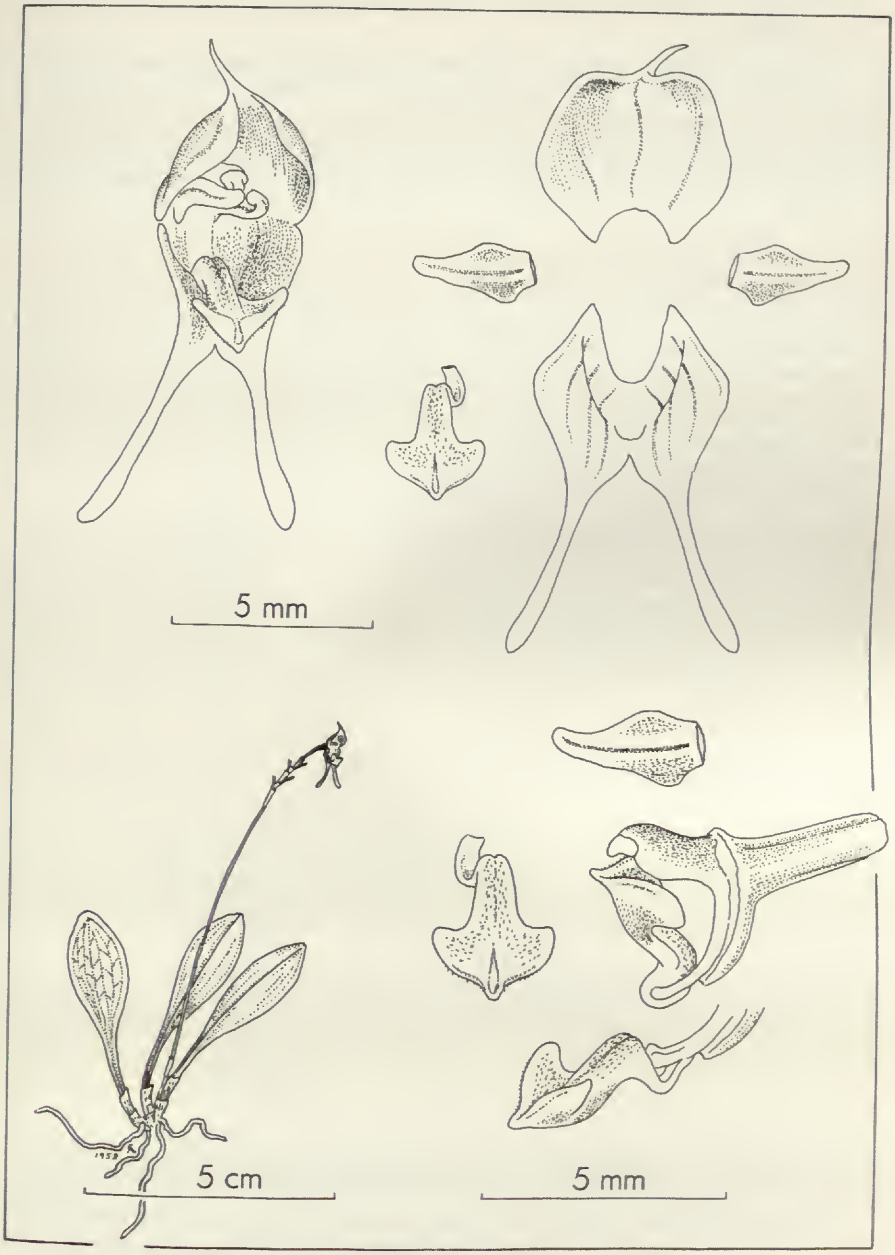


Plate 25. *Porroglossum rodrigoi* Sweet

Porroglossum schramii Luer, Phytologia 46: 379, 1980.

Ety.: Named in honor of James Schram of Los Angeles, California, co-discoverer of this species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, ca. 1 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, thickly coriaceous, verrucose, petiolate, 2.5-5 cm long including the petiole 0.8-2 cm long, the blade narrowly obovate or elliptical, obtuse, 0.8-1 cm wide, narrowly cuneate below into the petiole. Inflorescence a congested, successively flowering raceme, borne by an erect, slender, glabrous peduncle 9-10 cm long, with a few distant bracts, from low on the ramicaul; floral bract tubular, 5 mm long; pedicel 5 mm long; ovary subverrucose, 4 mm long; sepals translucent white with rose dots, with light brown tails, glabrous, 3-costate externally, the dorsal sepal ovate, 7 mm long, 4.5 mm wide, connate to the lateral sepals for 2 mm to form a gaping cup, the apex acute, gradually contracted into a thick, erect tail 5-6 mm long, the lateral sepals ovate, oblique, acute, 7 mm long, 5.5 mm wide at the base, connate 2 mm to each other and to the column-foot to form a deep, obtuse mentum, the apices gradually contracted into terete, laterally spreading tails ca. 7 mm long; petals translucent white, ovate-oblong, 4 mm long, 1.5 mm wide, narrowed to the slightly dilated, rounded apex, the margins obscurely obtusely angled below the middle; lip white, dotted lightly with purple, the blade obovate, 4.5 mm long, 4.25 mm wide, the apex broadly obtuse, minutely pubescent, with a short, obtuse, sulcate apiculum, with an erect, transverse, more or less pyramidal, glabrous callus at the base, extended below into a straplike claw bent around the free apex of the column-foot; column stout, semiterete, 1.5 mm long, the slender foot 3 mm long.

ECUADOR: Prov. of Zamora-Chinchipe: lithophytic in cloud forest between Loja and Zamora, alt. 1600 m, Nov. 1978, collected by W. Teague and J. Schram, flowered in cultivation by Teague in San Francisco, 14 March 1980, *C. Luer 5218* (Holotype: SEL).

This rare species, known only from the type collection, unfortunately no longer is in cultivation. It is one of the numerous discoveries of Walter Teague of San Francisco, California, and his companions. The flowers are white, dotted with rose, the sepals gradually narrowed into light brown tails. The lip is white with an erect, transverse, glabrous callus at the base.

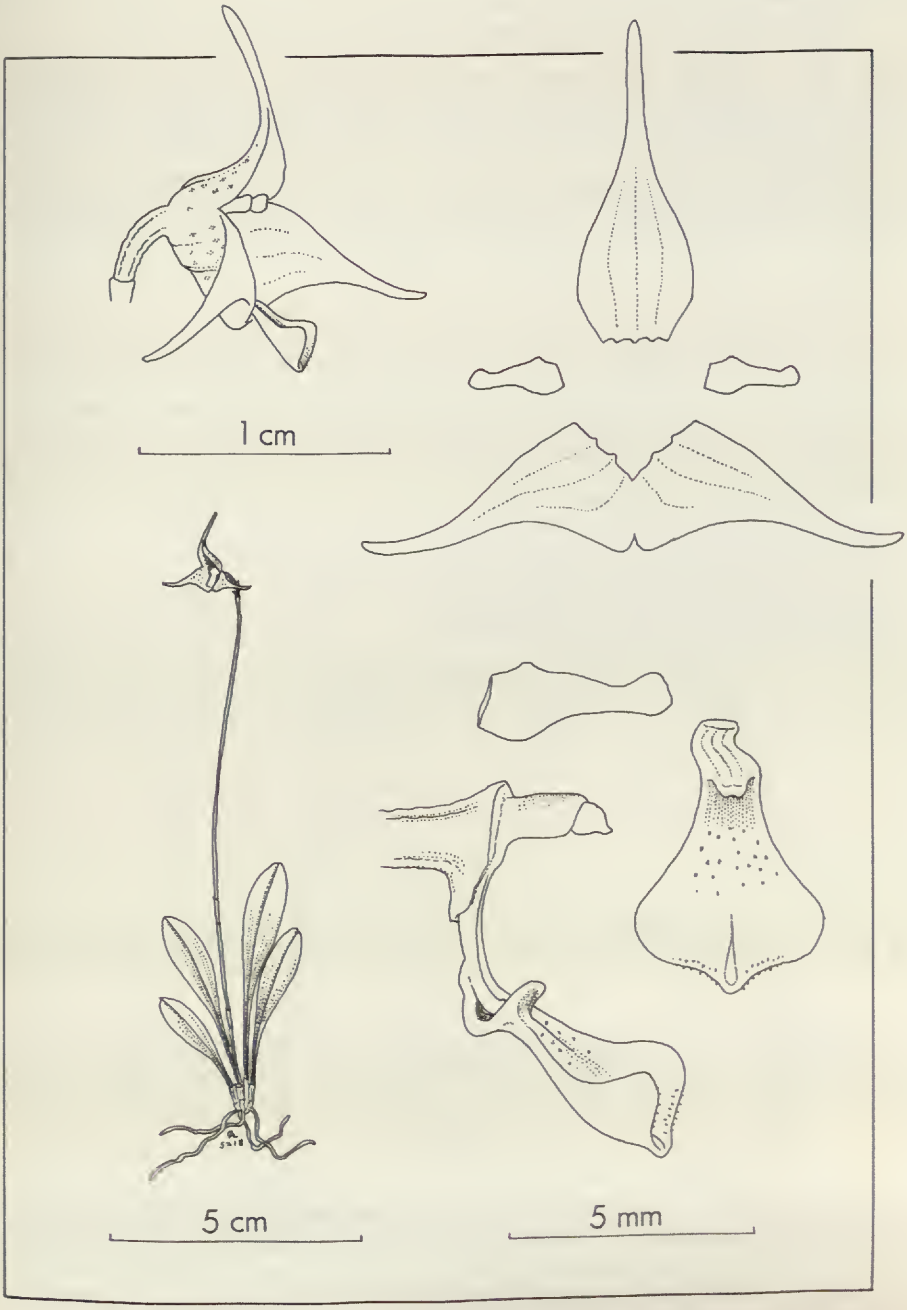


Plate 26. *Porroglossum schramii* Luer

Porroglossum sergioi P. Ortiz, Orquideología 10: 215, 1975, as *sergii*.

Ety.: Named in honor of its collector, Padre Sergio Restrepo of Medellín, Colombia.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 1.5-2.5 cm long, enclosed by 2-3 close, tubular sheaths. Leaf erect, coriaceous, smooth, 5-9 cm long including the petiole 2-4 cm long, the blade narrowly elliptical, acute, 1 cm wide, gradually narrowed below into the petiolate base. Inflorescence a congested, successively flowered raceme borne by a slender, erect peduncle 20-24 cm long, with 3 distant bracts, from low on the ramicaul; floral bracts tubular, 7 mm long; pedicel 10 mm long; ovary sub-verrucose, 5 mm long; sepals light rose, glabrous externally, shortly pubescent within, the dorsal sepal ovate, 10 mm long, 7 mm wide, connate to the lateral sepals for 4 mm to for a gaping tube, the apex acute, conduplicate, contracted into a slender, reflexed tail 11 mm long, the lateral sepals ovate, oblique, 9-10 mm long, 7 mm wide, connate 4.5 mm, broadly and shallowly concave, the acute apices gradually contracted into spreading tails ca. 15 mm long; petals white, cartilaginous, oblong-ovate, 5 mm long, 1 mm wide, obtusely angled on the labellar margin, the apex rounded, subclavate; lip white, the blade obovate, 5 mm long, 4 mm wide, the apex broadly obtuse, dark purple, microscopically pubescent, the lateral angles rounded, the disc with a tall, rounded carina above the base, the base contracted into a straplike claw bent with tension around the free apex of the column-foot; column semiterete, 2 mm long, the foot 5 mm long.

COLOMBIA: Dept. of Antioquia: Munic. of Frontino, Alto de Cuevas, above Nutibara, Padre Sergio Restrepo & O. J. Arango, *P. Ortiz V. 689* (Holotype: COL); same area, alt. 2050 m, 14 May 1983, *R. Escobar & E. Valencia 3308* (MO), flowered in cultivation at Colomborquideas May 1985, C. Luer illustr. 11294.

This species and the recently described *P. nutibara* were collected originally by Padre Sergio Restrepo and O.J. Arango. When *P. sergioi* was described by Padre Ortiz, a color photograph and a black and white photograph of an herbarium specimen of *P. nutibara* at JAUM were published. It was later realized that the black and white botanical drawing by Padre Ortiz and the type specimen at COL were not of the same species. *Porroglossum sergioi* was not the same as the white-flowered, clavate-tailed species recently described as *P. nutibara*. The two species grow sympatrically, and neither has been discovered elsewhere.

Porroglossum sergioi is distinguished by the large, light rose sepals shortly pubescent within, with all three sepaline tails slender and spreading. The callus of the blade of lip is tall and longitudinal.

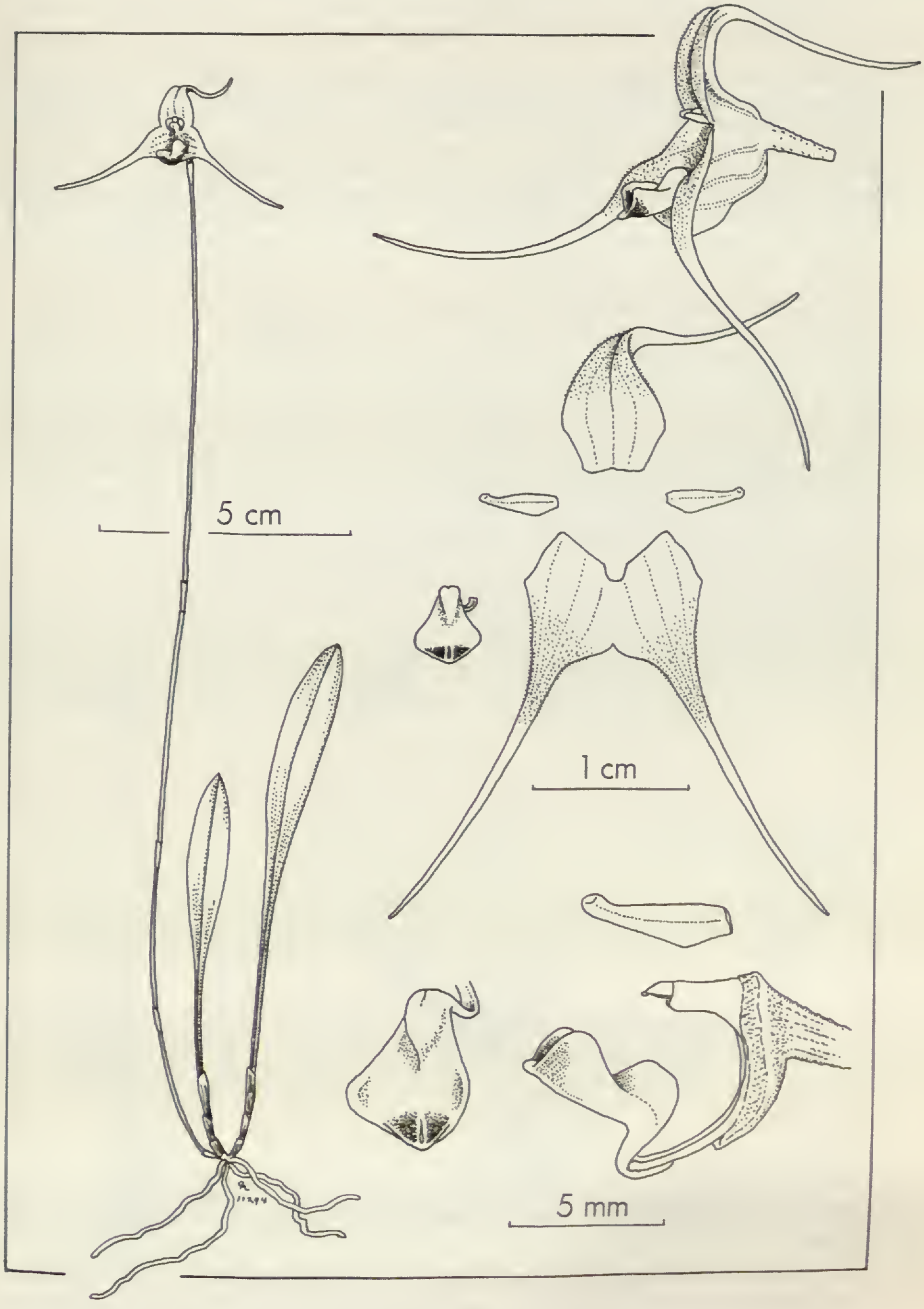


Plate 27. *Porroglossum sergioi* P. Ortiz

Porroglossum taylorianum Luer, Phytologia 46: 380, 1980.

Ety.: Named in honor of Taylor (Mrs. Frank) Slaughter of Pheasant Hill Orchids, Pittsburgh, PA., who cultivated this species and submitted it for identification.

Plant small to medium in size, epiphytic to terrestrial, caespitose; roots slender. Ramicauls erect, slender, 1-1.5 cm long, enclosed by 2-3 tubular, sheaths. Leaf erect, coriaceous, smooth, petiolate, 4-5 cm long including the petiole 2-3 cm long, the blade narrowly elliptical, acute to subacute, 7-9 mm wide, narrowly cuneate below into the petiole. Inflorescence a congested, successively flowered raceme, borne by an erect, slender, glabrous peduncle up to 11 cm tall, with a few distant bracts, from low on the ramicaul; floral bracts tubular, 5 mm long; pedicel 4 mm long; ovary subverrucose, 4-5 mm long; sepals translucent pale orange with light red-brown veins, subverrucose externally especially along the costate veins, glabrous within, the dorsal sepal suborbicular expanded, 5.5 mm long, 5.5 mm wide, connate to the lateral sepals for 2.5 mm to form a gaping cup, the apex rounded, abruptly contracted into a slender, reflexed, yellowish tail ca. 7 mm long, the lateral sepals transversely ovate, oblique, acute, long-acuminate, 16 mm long including the tail, 6 mm wide, connate 3.5 mm to each other and to the column-foot to form a deep, obtuse mentum, the apices contracted gradually into tapering, laterally reflexed, terete tails ca. 10 mm long; petals translucent yellow with an orange-brown midvein, oblong, 4.75 mm long, 1 mm wide, narrowed to the slightly dilated, rounded apex, the margins obscurely obtusely angled below the middle; lip white, suffused and dotted with purple, the blade obovate cellular-pubescent, 5 mm long, 3.5 mm wide, the apex obtuse with a midline sulcus between callus-like thickenings, the base with a tall, smooth, rounded, longitudinal callus, extended below into a straplike claw bent with tension around the free apex of the column-foot; column rose, semiterete, 2 mm long, the slender foot 4 mm long.

ECUADOR: Prov. of Napo: terrestrial on steep cliff above Baeza, alt. ca. 2000 m, collected by Stan Samuel in 1978, flowered in cultivation by Taylor Slaughter in Pennsylvania, 26 Feb. 1980, *C. Luer 5203* (Holotype: SEL).

This rare species was collected on the eastern slope of northcentral Ecuador east of Quito by Stan Samuel and cultivated by Mrs. Taylor Slaughter in Pennsylvania, where the plant presumably is still in cultivation. No other collections of this species are known.

The translucent, pale orange flower with red-brown veins of this species is similar to that of *P. muscosum* and its allied forms, but *P. taylorianum* is readily distinguished by the glabrous peduncle. From those species with a glabrous peduncle, this species is distinguished by the slender, recurved tails of all three sepals, and the glabrous, longitudinal callus of the lip.

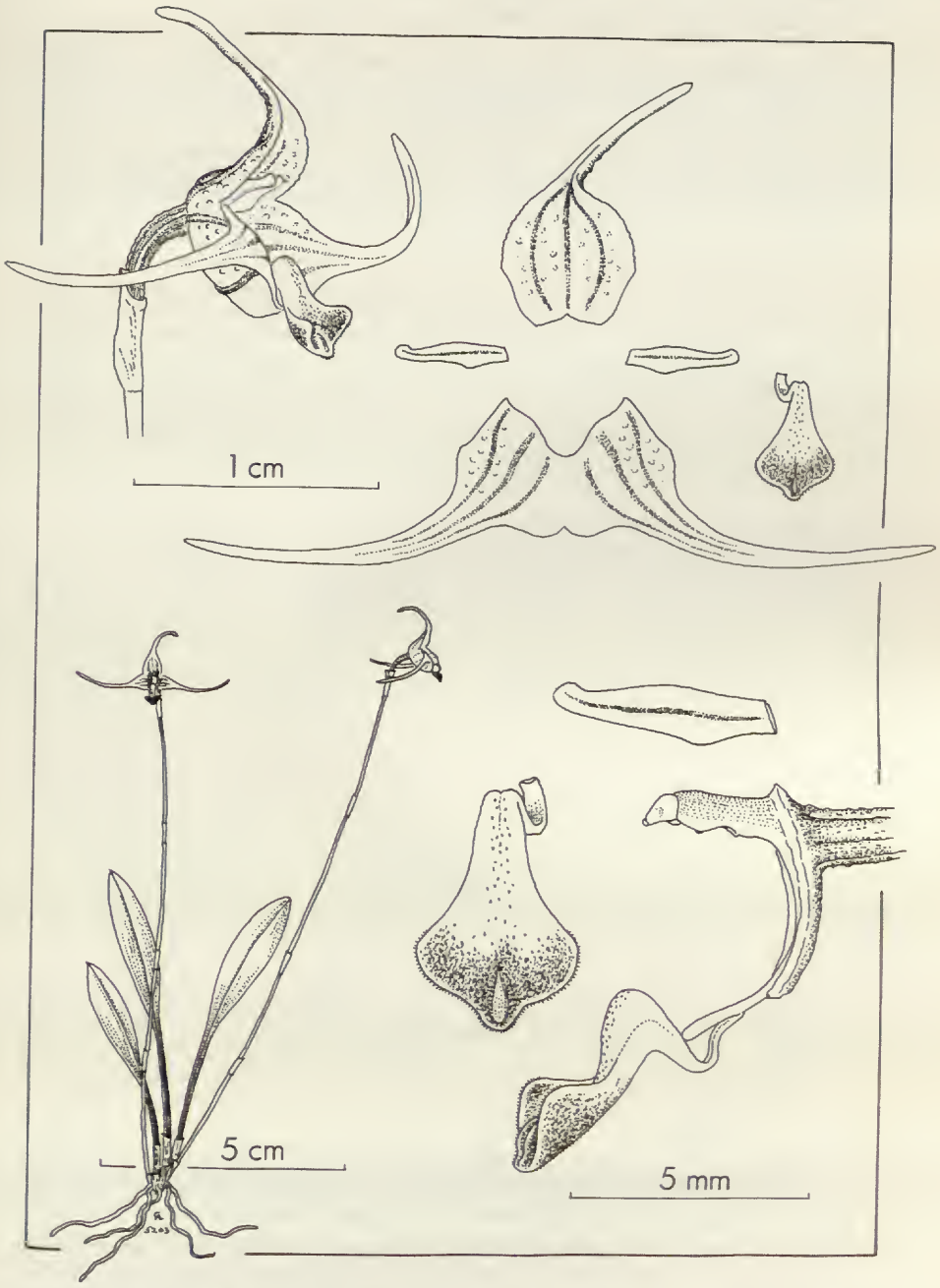


Plate 28. *Porroglossum taylorianum* Luer

Porroglossum teaguei Luer, Phytologia 46: 381, 1980.

Ety.: Named in honor of its discoverer, Walter Teague of San Francisco, CA.

Plant medium in size, epiphytic to terrestrial, caespitose; roots slender. Ramicauls erect, slender, 1-1.5 cm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, subverrucose, long-petiolate, 5-10 cm long including the petiole 2-4 cm long, the blade narrowly obovate, subacute, 10-13 mm wide, gradually narrowed below into the petiole. Inflorescence a congested, successively few-flowered raceme, borne by an erect to suberect, slender, glabrous peduncle 13-20 cm long, with a few widely spaced bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 8-10 mm long; ovary verrucose, 3-4 mm long; sepals bright purple, glabrous, the dorsal sepal broadly ovate, with rounded lateral margins, 6 mm long, 6 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex reflexed, conduplicate, abruptly contracted into a deflexed, more or less thickened tail 12 mm long; the lateral sepals transversely ovate, oblique, 6 mm long, 6.5 mm wide, connate 3 mm to form a short, conical mentum below the column-foot, the apices oblique, acute, contracted into slender tails ca. 20 mm long; petals translucent rose with a purple midvein, narrowly ovate, 5 mm long, 1.5 mm wide, narrowed to the slightly dilated, oblique apex, the margins obtusely angled near the middle; lip purple, the blade sagittate-anchoriform, 5 mm long, 4 mm wide, the apex obtuse, minutely ciliate, with a short, obtuse, sulcate apiculum, the base with a tall, smooth, rounded, longitudinal callus, deflexed below into a straplike claw bent with tension about the free apex of the column-foot; column stout, semiterete, 2 mm long, the slender, curved foot 4 mm long.

ECUADOR: Prov. of Pichincha: terrestrial on a road embankment near Mindo, alt. 2200 m, July 1975, collected by Walter Teague, flowered in cultivation in San Francisco, 5 June 1980, *C. Luer 5299* (Holotype: SEL).

This rare species has been found only once, and unfortunately it is no longer in cultivation. It is another of the many discoveries made by Walter Teague of San Francisco, California. It is sympatric with the locally abundant *P. amethystinum*, apparently its closest ally. Both species have bright purple flowers, but those of *P. teaguei* are larger with a much longer tail of the dorsal sepal. In addition, the ovary of the latter is verrucose instead of smooth, and the callus at the base of the lip is tall and rounded instead of low and flat.

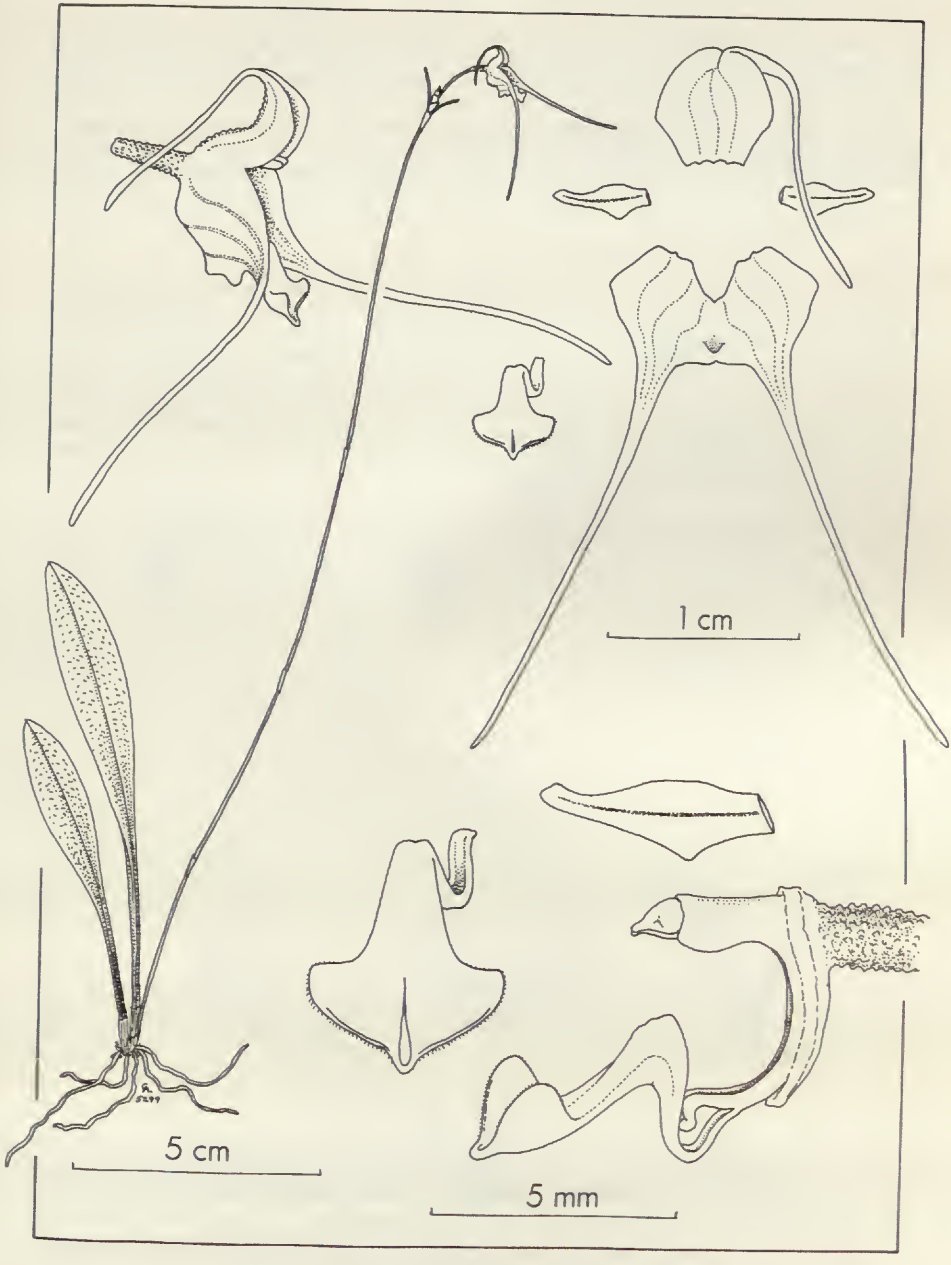


Plate 29. *Porroglossum teaguei* Luer

Porroglossum uxorium Luer, Phytologia 46: 381, 1980.

Ety.: From the Latin *uxorius*, "of the wife," referring to the discoverer of the species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls blackish, erect, slender, 8-11 mm long, enclosed by 2-3 tubular sheaths. Leaf erect, coriaceous, subverrucose, prominently purple-reticulate, 2.5-3 cm long including the petiole less than 1 cm long, the blade elliptical, obtuse to subacute, 9-11 mm wide, the base cuneate into the slender petiole. Inflorescence a congested, successively few-flowered raceme, the flowers non-resupinate, borne by a suberect to horizontal, slender, lightly scabrous peduncle 4-7 cm long, with a few, distant bracts, from low on the ramicaul; floral bracts tubular, imbricating, 5 mm long; pedicel 6 mm long; ovary twisted, 4 mm long; sepals translucent light tan, flecked with purple above the middle, the veins prominent externally, glabrous, the middle sepal ovate, 9 mm long, 5 mm wide, connate to the lateral sepals for 3 mm to form a gaping cup, the apex thickened, narrowly obtuse, the lateral sepals transversely obovate, 8 mm long including the apex, 5 mm wide, connate 3.5 mm, the obtuse apices purple, contracted into broadly rounded and thickened "tails" 2 mm long, 1.25 mm wide; petals translucent yellow with a purple midvein, oblong-ovate, 4 mm long, 2 mm wide, narrowed to the slightly dilated, rounded apex, the upper margin with an obtuse angle below the middle, the lower margin with a prominent, acute angle below the middle; lip purple, the blade cuneate, 4 mm long, 3.25 mm wide, the truncate apex pubescent, with an obtuse, sulcate apiculum, the base thickened with a low, glabrous, pyramidal callus, deflexed below into a straplike claw bent with tension around the free apex of the column-foot; column stout, semiterete, 2 mm long, the foot 4 mm long, the stigma with a pair of pointed processes.

ECUADOR: Morona-Santiago: epiphytic in cloud forest east of Paute, alt. 1700 m, 10 July 1977, *C. Luer, J. Luer, G. Luer & A. Andreetta 1683* (Holotype: SEL).

This species is apparently restricted to the eastern slopes of southern Ecuador where it has been found on a few occasions. It was first found in flower by Jane Luer in the forested valley above the present dam site east of Paute. It is closely related to *P. condylosepalum* Sweet from farther north, but *P. uxorium* may be distinguished by the reticulated leaves, sepals with longer, narrower, ascending tails, and a subpyramidal callus at the base of the blade of the lip.

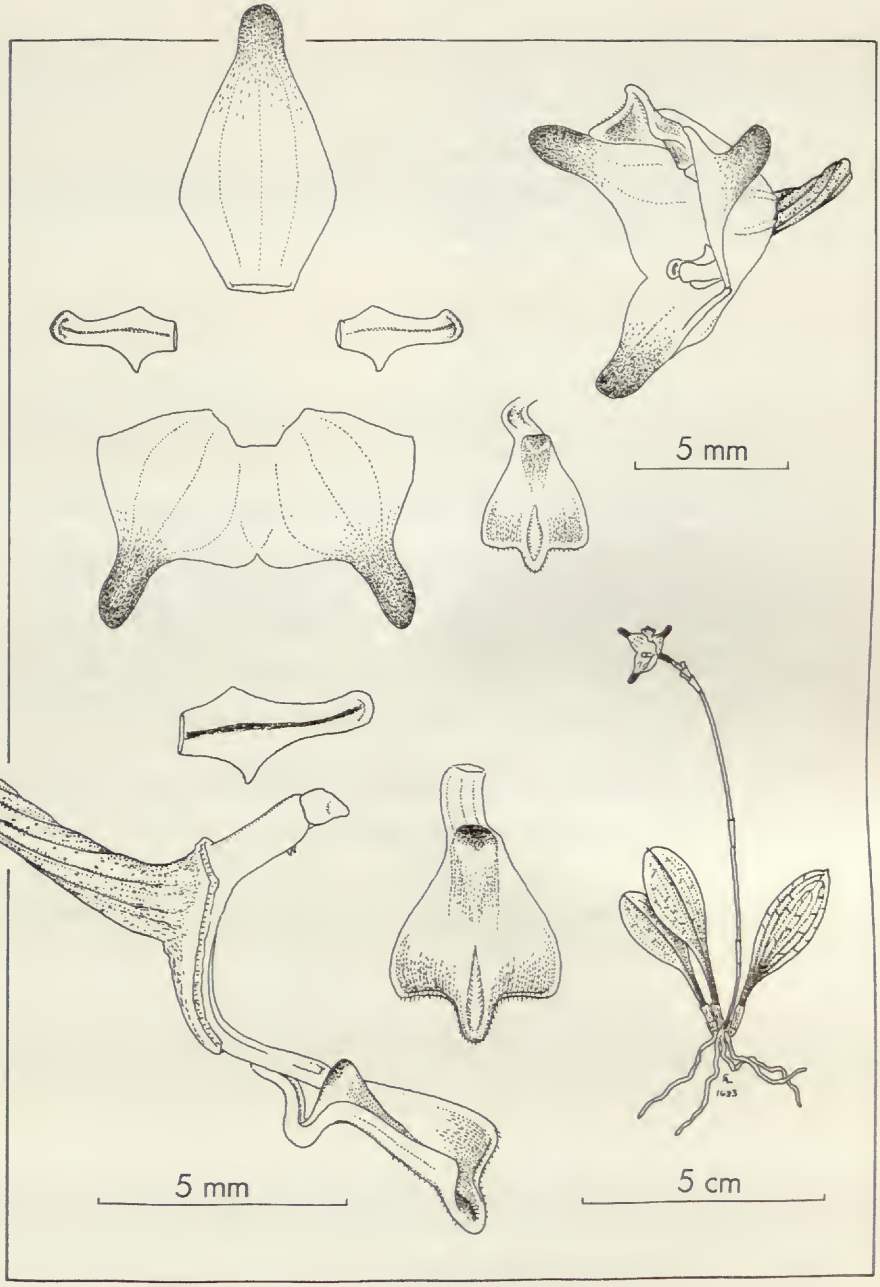


Plate 30. *Porroglossum uxorium* Luer

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